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GRANULAR AGGREGATE RESOURCES OF BIG BALD MOUNTAIN (NTS 21 O/1), SERPENTINE LAKE (NTS 21 O/2), AND CALIFORNIA LAKE (NTS 21 O/8) NEW BRUNSWICK

by

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TERRAIN ANALYSIS and MAPPING SERVICES LTD.

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RÉSUMÉ

Une proportion considérable des agrégats granuleux pour la région couverte par les cartes Big Bald Mountain (21 0/1), Serpentine Lake (21 0/2) et California Lake (21 0/8) se retrouve dans les dépôts stratifiés de contact glaciaire, spécialement des systèmes d'eskers, situés entre Long Lake et la limite est de la carte Serpentine Lake et le long de la rivière Nepisiguit; dans les dépôts fluvio-glaciaires le long des rivières Nepisiguit, Lower North Branch Little Southwest Miramichi et du ruisseau North Pole; dans les dépôts glaciaires (till d'ablation) situés au pourtour et à l'est de Trousers Lake; dans du colluvion localisé autour de Big Bald Mountain; et dans les alluvions situés le long des rivières Northwest Miramichi, Little Southwest Miramichi et Nepisiguit.

Les réserves calculées consistent approximativement de 82 millions de m^3 de sable et de gravier sous forme d'alluvions, de dépôts fluvio-glaciaires et de dépôts de contact glaciaire; d'au moins 200 millions de m^3 de dépôts de till d'ablation sableux et pierreux; et d'environ 11 millions de m^3 de colluvions sableux ou régolite. Localement, le matériel glaciaire (till d'ablation) et les dépôts de contact glaciaire démontrent une concentration de matériel grossier (bloc).

ABSTRACT

The bulk of the surficial granular aggregate in the Big Bald Mountain (21 0/1), Serpentine Lake (21 0/2) and California Lake (21 0/8) map areas occurs in ice-contact stratified drift deposits, especially esker systems along the Nepisiguit River and between Long Lake and the eastern edge of the Serpentine Lake map area; in glaciofluvial outwash along the Nepisiguit and Lower North Branch Little Southwest Miramichi rivers and North Pole Stream; in ablation till deposits in the area surrounding and to the east of Trousers Lake; in colluvium around Big Bald Mountain; and in alluvium along the Northwest Miramichi, Little Southwest Miramichi and Nepisiguit rivers.

Calculated reserves in the study area consist of approximately 82 million m^3 of sand and gravel in alluvium, glaciofluvial outwash and ice-contact deposits; at least 200 million m^3 of sandy stony ablation till deposits; and 11 million m^3 of sandy colluvium, or regolith. Locally, the ice-contact deposits and the ablation till are bouldery.

INTRODUCTION

The Study

This report summarizes the results and findings of field investigations undertaken during the summer of 1985. The objective of is study are to provide basic information on the distribution, extent, thickness and quality characteristics of granular aggregate deposits in the Northern Miramichi Highlands. This information is directed to both producers and consumers of granular aggregates in their search for available workable deposits, as well as land-use planners concerned with efficient resource utilization and protection.

Location of the Study Area

The area under investigation covers approximately 3,000 km^2 and is situated in north-central New Brunswick. It is bounded by latitudes 47°00′ and 47°30′ North and by longitudes 66°00′ and 67°00′ East (Figure 1) and covers the entire NTS map-sheets 21 0/1 (Big Bald Mountain), 21 0/2 (Serpentine Lake) and 21 0/8 (California Lake).

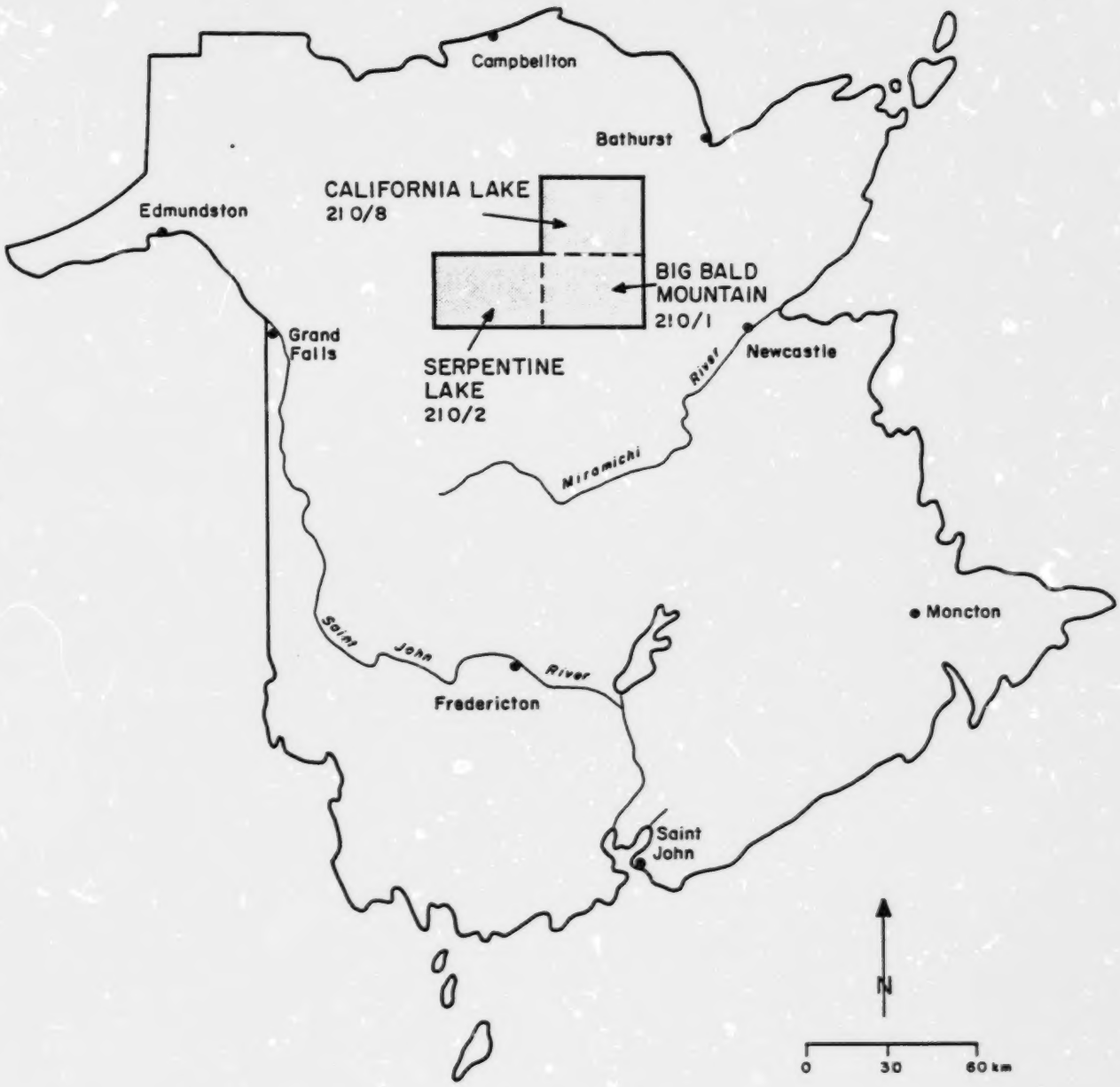


FIGURE I
LOCATION MAP OF STUDY AREA

Previous Geological Work

The surficial geology of the study area was initially investigated by Chalmers (1886). More recently, the surficial geology has been investigated in greater detail by Gauthier (1979, 1982, 1983). The surficial geology and till geochemistry of a small area around Trousers Lake on the west edge of the study area was investigated in detail by Fyffe and Pronk (1985). Rampton et al. (1984) produced a report on the Quaternary geology of New Brunswick. That report describes the nature and genesis of the surficial materials throughout the province, including the study area.

Systematic soils mapping has been completed for the extreme western part of the study area (Langmaid et al. 1976). Special studies of the deep bedrock weathering have been conducted in the vicinity of Big Bald Mountain by Gauthier (1980), Wang et al. (1981), and Veillette and Nixon (1982).

A map of the bedrock geology of northern New Brunswick, which encompasses the study area, has recently been compiled by Davies (1979). The bedrock geology of the study area has been mapped in detail by geologists of the Geological Survey of Canada (Anderson 1970; Smith 1973) and of the New Brunswick Mineral Resources Division (Fyffe 1971; Irrinki 1971). The numerous reports and maps discussing different aspects of the bedrock and economic geology are listed in Carroll (1985).

Granular materials have been mapped and described in all surrounding areas: to the west by Lavergne and Hunter (1982a) and Seaman (1985); to the north by Brinsmead (1979) and Finamore (1979); to the east by Brinsmead (1978) and Thibault (1978); and to the south by Lavergne and Hunter (1982a, b).

PHYSIOGRAPHY

The study area lies mainly within the southeast half of the Northern Miramichi Highlands, with a small part being in the Eastern Miramichi Highlands (Rampton et al. 1984). In the central core of the Northern Miramichi Highlands, where the northern part of the study area lies, an undulating plateau-like upland surface is broken by peaks that generally have elevations above 600 m. Relief is commonly greater than 200 m due to deeply incised streams. The southern and central parts of the Northern Miramichi Highlands, which include most of the study area, are characterized by ridges and hills separated by broad depressions that typically contain lakes and poorly drained ground. "In the southeastern part of the Northern Miramichi Highlands, ridges and valleys have a northwest-southeast orientation ..." (Rampton et al. 1984, p.73). The Nepisiguit River valley, which crosses the Northern Miramichi Highlands, is entrenched to 370 m below the general upland surface. The Eastern Miramichi Highlands have a rolling surface with relief rarely exceeding 60 m, but the

surface slopes generally to the east. Most ridges and valleys have an eastward orientation paralleling the slope.

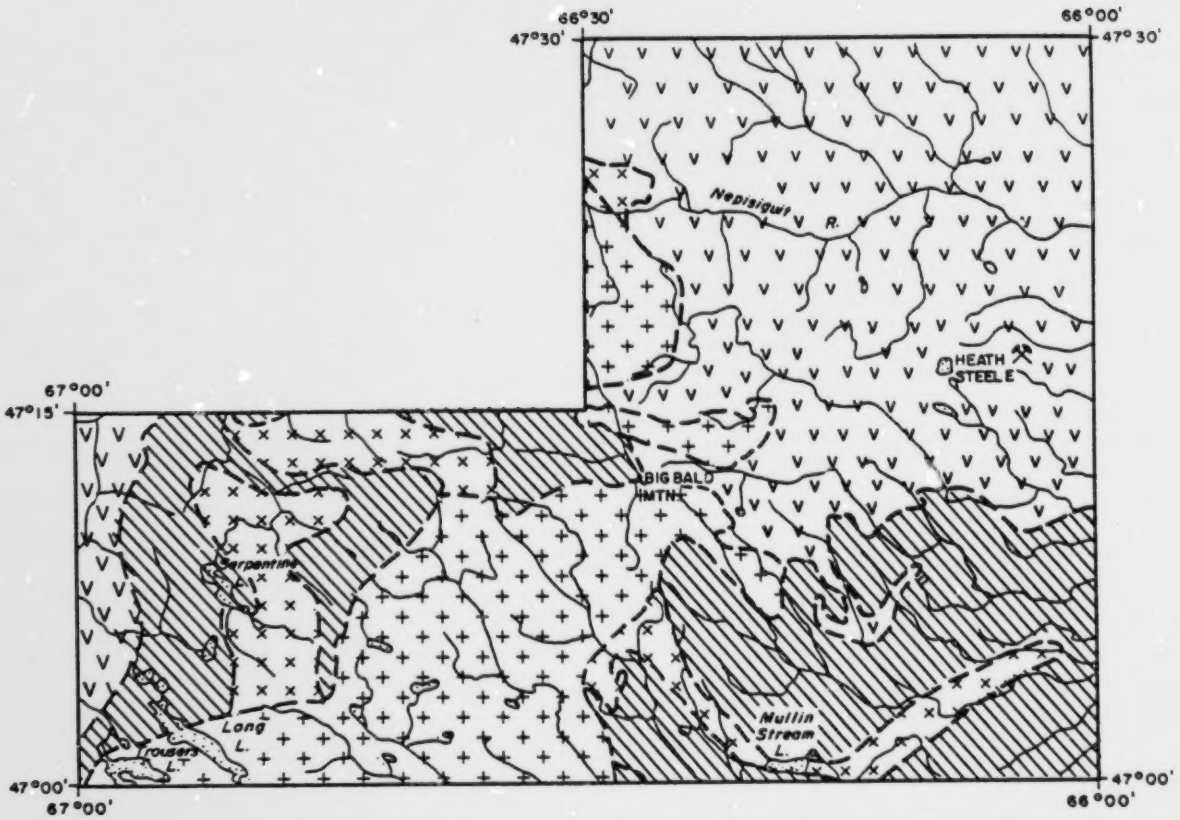
The core of the Northern Miramichi Highlands is characterized by a dendritic drainage pattern and is well drained due to the high relief. Drainage in the southern and eastern part of these highlands is also good, except in the broad valleys where glacial drift and derangement of drainage has resulted in some ponding of water. Drainage patterns here, as in the Eastern Miramichi Highlands, are subparallel (Rampton et al. 1984).

GEOLOGY

Bedrock

The distribution and chronostratigraphy of the various bedrock units present in the area are shown on Figure 2. Reference can be made to Davies (1979) for greater detail and internal subdivisions of units.

The oldest rocks of the area are the Ordovician felsic to mafic volcanics and metasediments of the Tetagouche Group. They are composed of metabasalt, metagabbro, metarhyolite and metarhyolitic tuff, with some quartz-feldspar metaporphyry, slate, metagreywacke, graphitic slate, maroon slate, chert, and metaquartzite (Fyffe 1971; Williams and Jones 1976). The area of Ordovician metasedimentary rocks is underlain predominantly by



LEGEND

DEVONIAN

- Granite and minor gabbro
- Felsic to mafic volcanics

ORDOVICIAN

- Deformed granite and minor gabbro
- Metasediments, metaquartzite
- Felsic to mafic volcanics and metasediments
- Geological boundary

N

0 10 20 km

FIGURE 2

BEDROCK GEOLOGY MODIFIED AFTER POTTER et al. (1979) AND FERGUSON AND FYFFE (1985)

metaquartzite, phyllite, slate and greywacke; some beds of felsic to mafic metavolcanic rocks and argillite are also present (Irrinki 1971, 1972, 1977). The Ordovician is orange to red, foliated and porphyritic granite (Irrinki 1971). Locally, granodiorite and quartz monzonite may be present (Irrinki 1972).

The Devonian rocks include a large body of light grey to pink, biotite and muscovite granite and some gabbro, which underlies the south-central part of the area (Crouse 1978), and a sequence of siltstone, sandstone, greywacke, basaltic tuff, agglomerate and rhyolite, which underlies the western edge of the area (Irrinki 1977).

Surficial

Deeply weathered bedrock and regolith that are exposed over the higher areas of the Northern Miramichi Highlands are believed to have developed over a long period of non-glacial time (Rampton et al. 1984). The high parts of the Highlands may only have been glaciated prior to the Wisconsinan as suggested by the preservation of deeply weathered granite, tors, and nivation terraces on these uplands. Seaman (1985a,b) questions the antiquity of the glaciation of this surface, as he believes that the tors developed during an early stage in the Late Wisconsinan deglaciation, when the upland areas became exposed as nunataks. Others, including Gauthier (1979, 1983), have suggested that these high areas were covered by nonerosive glacial ice during the Wisconsi-

nan. Ground at intermediate elevations surrounding the highest parts of the Northern Miramichi Highlands, which was glaciated during the pre-Wisconsinan, characteristically lacks tors, but has a muted glacial topography, a phenomenon cited by Rampton et al. (1984) as being evidence of Early Wisconsinan glaciation.

During the Late Wisconsinan, the southern part of the area was subjected to intense glacial scour by easterly-flowing glaciers. Local ice caps may have developed around the flanks of the Northern Miramichi Highlands and contributed to this flow (Rampton et al. 1984). Ice flowed northeastward toward Chaleur Bay along the eastern edge of the Miramichi Highlands. A short-lived glacial lake may have been impounded in the Nepisiguit River valley by ice occupying its lower extremities.

Deglaciation of the southern part of the study area resulted in the formation of ribbed ablation moraines, long eskers and glaciofluvial complexes. Proglacial meltwater drainage was generally eastward, parallel to present stream courses, except near Serpentine Lake where it was diverted northward, probably into the western extremities of the Nepisiguit drainage system.

The Holocene has been marked primarily by weathering and soil development on most surfaces. Exfoliation and weathering of the granite tors near Big Bald Mountain has resulted in the production of grus (Rampton et al. 1984). Peatlands have

developed slowly in poorly drained areas. The area has recently been affected by earthquake activity.

GRANULAR AGGREGATE RESOURCES

Field and Laboratory Methods

The study was completed in three phases; namely (1) preliminary investigations and data collection, (2) field investigation, and (3) laboratory analysis.

Preliminary investigations and data collection included (a) compilation and review of relevant reports and maps and information in our company files concerning geology, soils and construction materials, (b) preliminary aerial photograph interpretation to outline probable aggregate sources, and (c) review of field reports and test data from the New Brunswick Department of Transportation (DOT) files.

A review of high elevation aerial photography was completed as a guide to locating and outlining aggregate resources. Detailed aerial photograph interpretation of the potential sources was then completed on low elevation aerial photographs.

Field investigation in the study area involved traversing most roads and trails. All sites having potential as sources for granular materials or borrow materials were investigated.

At each site the following investigations were conducted and documented in the field:

(a) surface inspection and shallow hand pitting to determine the surface extent of the deposit;

(b) an inspection of exposures and excavations to determine the configuration and depth of the deposit (interesting pit exposures were photographically documented);

(c) a visual assessment of the types of materials present, the number and size of boulders present, and an assessment of the distribution of the coarser aggregate present;

(d) an assessment of the impact of human activity on the deposits;

(e) an assessment of the activity status of visited pits.

More detailed field investigations and descriptions were completed at sites where it was apparent that significant amounts of granular material were present. At these sites samples weighing approximately 5 kg were collected from samples of representative units for mechanical analysis and 100 pebbles were collected from typical pebbly gravels for lithologic analysis.

The field investigations and observations are the basis for the descriptions in Appendices A through F.

Laboratory analysis involved the sieve analysis of samples from major deposits by Atlantic Analytical Services Limited (Saint John, N.B.). The samples were wet sieved through a 75 μm sieve and then passed through sieves with the following openings - 31.5, 25.0, 19.0, 9.5, 4.75, 2.36, 1.18 mm and - 600, 300, 150, 75 μm. In addition, pebbles collected in the field were washed, separated according to lithology and counted.

Volume calculations of deposits involved assigning depths to deposits by projecting the depths observed in pit excavations to areas beyond the pit boundaries. Confidence in these reserve figures is affected by the reliability of material thickness data and of deposit boundaries. In no case can the calculated reserve figures be considered absolutely definitive. Traditional exploration methods, including detailed test-pitting or drilling with power equipment, will be required to further define reserve estimates.

Quality Limitations

The potential of a granular aggregate deposit for various uses is primarily a function of its textural characteristics and the lithologic characteristics of its component grains.

Textural characteristics such as a significant content of fine particles (e.g., silt and clay) or improper grading (particle size distribution within granular materials) can limit the use of granular materials. A silt and clay content in excess of 5% is considered deleterious for many uses. Washing can generally remove silt and clay from a material, but such treatment increases the cost of exploitation. An evaluation of the fines content within deposits has been achieved by visual estimation in the field for most deposits and determined by sieve analysis on selected typical samples for significant deposits (Appendix A, C, E). For many uses, well-graded granular aggregate material is required (i.e., a relatively even distribution of selected grain sizes). Grading can be improved by crushing, screening or by using various combinations of materials, but this increases exploitation costs. A subjective evaluation of the grading of deposits is possible from assessing the description of their materials in Appendix A, C and E; and a qualitative evaluation is possible from assessment of the sieve analyses.

Most deposits, with the rare exception of some ablation tills, are relatively free of silt and clay. They consist of mixtures of pebbly sand, and sandy, pebbly to cobbly gravels. Some ablation tills near Long Lake and Trousers Lake, and ice-contact deposits along the Nepisiguit River contain large numbers of boulders that may limit their use and exploitation. Colluvial deposits consist primarily of poorly graded coarse sand.

Lithologic characteristics of deposits, such as the composition of the clasts within a deposit, affect the quality of the material for different uses. Deposits containing hard, strong and durable clasts, such as most igneous and metamorphic clasts (all resistant to disintegration under mechanical impact) outcropping in the study area, have more potential for use in most aggregates than deposits containing soft materials such as shale and friable schists and sandstones. It is noteworthy that most metasedimentary pebbles, particularly quartz-muscovite schist pebbles in the study area were highly silicified and very hard and durable. For usage having rigid specifications, the aggregate should be free of deleterious substances that can cause adverse chemical reactions; chert and some felsic extrusives are the primary offenders (Bates, 1969). In cases of suspected reactivity, the use of low-alkali portland cement or partial substitution of a pozzolanic material for some of the cement is recommended (Bates 1969; Swenson 1973).

The lithologic analyses reported in Appendices A, C and E divide the clasts into two groups: sound and unsound. The two groups are differentiated primarily on the basis of the resistance of the clasts to disintegration under mechanical impact (with the exception of chert, which exhibits chemical instability in concrete). The results of this test should not be confused with those from quantitative soundness tests, such as the magnesium sulphate test, nor with abrasion tests, such as the Los

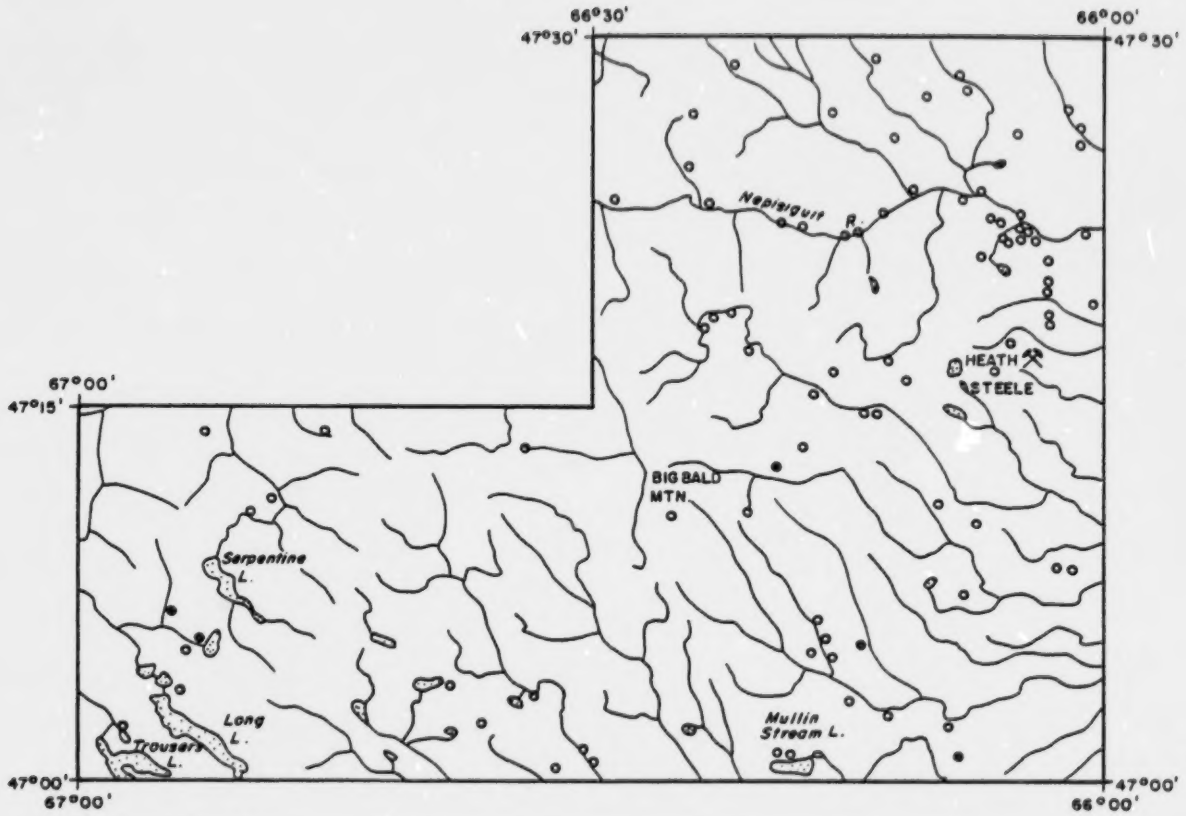
Angeles abrasion loss test used by the Department of Transportation.

The pebbles in most deposits are sound (Appendices A, C and E); the exception being where sheared volcanics and schists or sulphide-rich rocks constitute a significant proportion of the pebbles. The high number of felsic intrusive clasts (if they are susceptible to alkali-reactivity) in some deposits may limit their use for some purposes, such as concrete aggregate.

Sources of Granular Aggregate

Five basic types of granular aggregate deposits are found in the study area: (1) glaciofluvial outwash, (2) ice-contact stratified drift, (3) ablation till, (4) colluvium, and (5) alluvium. The location and boundaries of all deposits are shown on the granular aggregate resource maps (Plates 86-7A, 7B; 86-8; 86-9A, 9B). Detailed information on individual deposits is recorded in Appendices A, C and E. Appendices A, C and E also contain the results of laboratory analyses for samples obtained from selected deposits. Figure 3 shows the location and 1985 status of borrow and gravel pits in the study area.

1) Glaciofluvial outwash: Glaciofluvial outwash consists of material that is deposited beyond the margins of a glacier by meltwater streams. Generally, this material will consist of well-washed, horizontally stratified sand and gravel. Glacio-



LEGEND

PIT

○ INACTIVE OR ABANDONED

● ACTIVE OR ACTIVE ON DEMAND

FIGURE 3

STATUS OF SAND AND GRAVEL PITS IN 1985

fluvial outwash generally forms flat-topped or terraced plains and valley trains.

Significant exploitable masses of outwash are present along the Nepisiguit River below Indian Falls Depot, (08-23, 24, 25, 26), along the Lower North Branch Little Southwest Miramichi River (01-6, 8) and along the North Pole Stream near Sinclair Lake (02-37).

Approximately 9.5 million m^3 of pebbly to stony gravel are present along the Nepisiguit River; about 7.5 million m^3 of relatively sandy fine gravel are present along the Little Southwest Miramichi River and about 2.4 million m^3 of gravel are present along the North Pole Stream.

2) Ice-contact stratified drift: These sediments are deposited in direct contact or in close proximity to glaciers. Generally, these deposits consist of sand or gravel with variable quantities of clay, silt and large-sized clasts. Sorting may be variable with sharp lateral and vertical textural differences. The deposits may contain inclusions of till and commonly show post-depositional deformation structures due to the melt-out of glacier ice. In the study area, these deposits are generally free of silt and clay, and commonly contain an abundance of boulders and large cobbles. Ice-contact stratified drift is commonly found in eskers, kames and kame complexes.

Significant exploitable masses of ice-contact stratified drift are present along the Nepisiguit River above Indian Falls (08-27, 28, 29), at Chester Mine on the Sevogle drainage system (01-11), and within the numerous large esker complexes north and east of Trousers Lake (02-35, 38, 39, 43, 44). Approximately 21 million m^3 of pebbly and cobbly gravel are present along the Nepisiguit River; about 3.4 million m^3 of well-graded gravel at Chester Mine; and 26 million m^3 of cobbly to bouldery gravel within the eskers near and to the east of Trousers Lake. Usage of the latter deposits may be restricted in places where the content of boulders and large cobbles is high. However, some portions of these deposits are relatively free of boulders and large cobbles and can be outlined by more detailed exploration.

3) Ablation till: These deposits consists of material, which having been carried within and upon ice to the terminal zone of the melting glacier, is deposited onto the ground by sliding, flowing or subsidence. Ablation till is typically loose and not fissile. The material may be washed, but is generally not well sorted. Masses of lodgement till and ice-contact stratified drift may occur within the morainic topography primarily composed of ablation till.

Significant masses of ablation till are present along the northern edge of the Nepisiguit River valley to the west of Indian Falls Depot and throughout the area surrounding, and to

the east of, Long Lake (02-40). In the area surrounding Long Lake a very large volume of sandy ablation till is available but is commonly very bouldery and would require screening for most usages. Boulders in some areas of very bouldery ablation drift (see Plate 86-8) may be utilized as riprap.

4) Colluvium: This material has formed through the weathering of bedrock, primarily granites, and its subsequent downslope movement through mass wasting. Some till may be included in this material, but its composition and texture is similar to that of the weathered bedrock (or regolith) and colluvium. Large areas of colluvium occur in the vicinity of Big Bald Mountain (01-12, 33, 47, 48). The colluvium and regolith are primarily composed of sand with rock fragments at depth. The sand is mainly composed of angular quartz and feldspar crystals (Gauthier 1980), little modified subsequent to disintegration of the granites. Approximately 11 million m^3 are available for exploitation near Big Bald Mountain, but these materials require further testing to assess their durability, soundness and resistance to breaking upon loading.

5) Alluvium: Alluvium, which is of fluvial origin, occurs along most streams. It may occur in floodplains, alluvial fans or terraces but is most commonly within floodplains and not easily exploitable. Alluvium within the study area commonly consists of stratified sand or gravel in floodplains and terraces paralleling major streams. Discrete silt beds may be present,

especially at their surface. Significant areas of alluvium have been noted near the headwaters of the Northwest Miramichi River (08-14) where 4 million m^3 have been outlined, and along North Pole Stream (08-36) where 1.3 million m^3 have been outlined. The alluvium at both of these localities is primarily sandy gravel and pebbly sand. Along the Nepisiguit River, gravel and sand on higher ground in the form of outwash or ice-contact stratified drift is generally available for exploitation.

CONCLUSIONS

Recoverable reserves of granular material in the study area consist of approximately 77 million m^3 of sand and gravel in glaciofluvial outwash and ice-contact deposits; in excess of 5 million m^3 of good sand and gravel in alluvial deposits; in excess of 200 million m^3 of sandy stony ablation till deposits; and approximately 11 million m^3 of sandy colluvium. Bouldery ice-contact deposits and ablation drift may be utilized as sources of riprap.

Various physical and economic factors may restrict exploitation of some of these reserves. However a number of small deposits are available throughout the study area that may be utilized for local construction and road improvements.

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APPENDIX A

SAMPLE DESCRIPTIONS OF BIG BALD MOUNTAIN (NTS 21 0/1)

LOCATION #: 01-1 AP#: 75501-66

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Pit Parish: Southesk

Status: Abandoned UTM: 039 104

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

Top removed by scraping

0.0-0.7 m Sand: Interbedded coarse sand and fine pebbly sand; coarse sand beds: 0.03-0.12 m thick, well sorted, subangular; 60% of total thickness consists of pebbly sand beds: 0.03-0.08 m thick, fine pebbles up to 10 mm (rare), average 3 mm

0.7-2.0 m+ Gravel: Fine cobbly gravel; cobbles up to 15 cm in diameter, subangular in matrix of medium-coarse sand; 30% sand, 30% cobbles, 40% fine to very fine pebbles. (Sample)

2.0 m Till: Silty, compact, olive-brown; 30% pebbles, 20% silt

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	96.8	95.3	88.8	79.3	66.5	40.0	13.7	10.1	0.6	0.3

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 1%	Sound Lithotypes: 99%
felsic volcanic 1	granite 35; granitic gneiss 35; schist 16; vein quartz 6; intermediate volcanic 5; porphyry 1; felsic volcanic 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			Limited

LOCATION #: 01-1 (contd.)

This deposit, which is located just north of Mullin Stream Lake, is small in size, but accessible by an old lumber road. Most of the material consists of well-sorted pebbly sand and fine cobbly gravel (sample is considered representative of unit). The reserves are estimated at 4,800 m^3 as about 28,350 m^3 appears to have been removed. The remaining material could be used locally as a source of material for lumber road improvements.

LOCATION #: 01-2 AP#: 76514-147

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Pit Parish: Southesk

Status: Abandoned UTM: 045 180

NTS: 20 0/1 W

SECTION DESCRIPTION & COMMENTS:

0.10 m Overburden: Mature black spruce, humus and soil development

0.0-2.5 m Gravel: Pebbly sandy gravel, pebbles rounded, cobbles up to 10-15%, 30% pebbles, rare boulders. (Sample taken at 1.5 m from top of gravel)

2.5-7.5 m+ Sand: Fine sand, well stratified (horizontally), rare silt beds; sand is micaceous (muscovite and biotite)

This deposit, which is located just south of the junction between Little South Sevogle River and South Sevogle River, consists of pebbly sandy gravel (sample is considered representative) overlying well-stratified micaceous sand that could be used for borrow. Future exploitation of this deposit is limited by size, as 5500 m³ of material has already been removed.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	89.7	85.6	81.8	71.4	65.3	52.6	29.4	9.5	8.8	1.4	0.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 6%	Sound Lithotypes: 94 %
carbonatized and sheared volcanic 5; sandstone 1	quartz-muscovite schist 42; vein quartz 19; granite 8; granitic gneiss 8; intermediate volcanic 5; chlorite schist 4; metaquartzite 4; gabbro 3; porphyry 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m³) probable
		0-2.5	Limited

LOCATION #: 01-3

AP#: 76514-147

Type of Deposit: Glaciofluvial outwash

County: Northumberland

Exposure Type: Pit

Parish: Northesk

Status: Abandoned

UTM: 038 195

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

0.1 m Overburden:	Organic; mature spruce
0.5-1.0 m Gravel:	Pebbly sandy gravel; few boulders (maximum 50 cm diameter); pebbles 25-30%
1.3 m Sand:	Clean, medium pebbly sand
0.2 m Sand:	Moderately compact, silty medium to coarse sand
1.5-2.0 m Sand:	Clean, medium sand
1.0-1.5 m Gravel:	Very rusty, pebbly gravel, some sand
0.5-1.0 m Silt:	Brownish grey
4.0 m Sand:	Medium pebbly, clean

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	92.7	89.1	86.5	75.7	63.1	47.1	26.2	12.3	11.4	3.6	2.0

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 1%	Sound Lithotypes: 99%
felsic tuff 1	quartz-muscovite schist 52; vein quartz 13; granite 12; gneiss 7; intermediate volcanic 7; phyllite 5; felsic volcanic 1; gabbro 1; metaquartzite 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
3.7	3.7	8.0	Limited 296,000

LOCATION #: 01-3 (contd.)

4.0 m Gravel: Gravel (partly covered) pebbly sandy gravel. (Sample of gravel at top.)

This deposit, which is located just north of the junction between the Little South Sevogle River and South Sevogle River, consists of stratified pebbly sandy gravel and sand. Much of this deposit is not exposed, and the sample might not be representative of the deposit in total. Further occurrences of silt beds might restrict the use of this deposit, even for local fill. This deposit is accessible from the road and could be used for local borrow material.

LOCATION #: 01-4

AP#: 76-514-227

Type of Deposit: Ice-contact

County: Northumberland

Exposure Type: Small Borrow Pit

Parish: Northesk

Status: Abandoned

UTM: 024 217

NTS: 21 O/1 W

SECTION DESCRIPTION & COMMENTS:

Composite section over 600 m to north of pit - 2.0-3.5 m pebbly sandy gravel. Same as borrow pit.

0.10 m Overburden:	Organic and Ae
5.0 m Gravel:	Pebbly sandy gravel; 5% cobbles up to 20 cm in diameter; 15% pebbles; 30-40% sand. May be underlain by sand or till
Sample	Sample from 2.0 m depth

This ice-contact esker-like deposit consisting of pebbly sandy gravel is limited in extent due to the presence of the South Sevogle River on its west side and till-mantled rock on its east side. A series of section (over 600 metres) along the road have been examined and the sample taken in the borrow pit is considered representative of the gravel throughout the deposit. This deposit has good

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	85.0	85.0	71.6	51.5	40.7	31.2	20.4	11.0	6.0	3.5	1.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0%

Sound Lithotypes: 100%

quartz-muscovite schist 64; vein quartz 13; metasediments 11; granite 5; diorite 2; gneiss 1; felsic volcanic 1; intermediate volcanic 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
14	14	3.5	490,000

LOCATION #: 01-4 (contd.)

potential for crushing or screening. This deposit should be considered for future exploitation because of its favourable accessibility, grading, thickness and size.

LOCATION #: 01-5 AP#: 76-514-146

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Borrow Pit Parish: Southesk

Status: Abandoned UTM: 034 191

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

0.08 m Overburden: Humus and Ae

4.0-6.0 m Gravel: Gravel, sandy, pebbly; 1% boulders to 40 cm (flat); 54% pebbles (small, flat), 45% sand; subangular, platy all fractions (sample)

0.5-1.0 m+ Sand: Silty sand

This deposit is located north of the junction between the Little South Sevogle River and the South Sevogle River. Road sections and a borrow pit have been examined and indicate that a blanket of sandy pebbly gravel overlies a pebbly sand within the deposit. The sample is representative of the gravel unit. Approximately 50,000 m³ of gravel has been removed from the existing pit, but very little sand has been removed. The pit was abandoned recently. This deposit could be considered for a source of aggregate as it is easily accessible by a good road and it is quite extensive with a good thickness of gravel being present. The sand may be too silty for purposes other than poor quality fill, but the gravel has good potential as a crushing material.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	89.9	84.4	75.1	61.0	48.7	36.2	23.7	11.0	5.7	3.4	1.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0%	Sound Lithotypes: 100%
	quartz-muscovite schist 80; vein quartz 11; quartz-feldspar schist 7; granite 2

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m³) probable
55	55	3.0	1.65 million

LOCATION #: 01-6 AP#: 76514-220

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Road scraping Parish: Southesk

Status: Abandoned UTM: 906 203

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

0.15 m Overburden: Humus, cover Black Spruce, Labrador Tea and Moss

1.15 m+ Gravel: Fine pebbly sandy gravel (clean); pebbles 5%, very few cobbles in scraping. Sample taken at 1.0 m depth.

Pebbles taken from exposure and hand dug pits

This large deposit, which is located along the Lower North Branch Little Southwest Miramichi River, consists of glaciofluvial outwash. It is flat and well drained except for areas located directly adjacent to the Miramichi River. Two samples were taken for analysis (01-6, 01-8); the results tend to show that the texture of the gravel from both areas is comparable. Two small roadside scrapings (sites 121 and 122) showed similar gravel, but one small roadside exposure (site 123) showed coarser textured material (white granite boulders were abundant). This extensive deposit is accessible from the south by a logging road that is only in good condition to just south of

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	95.4	85.8	62.0	32.0	12.8	7.3	4.5	2.3	

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 3%	Sound Lithotypes: 97 %
felsic tuff 3	granite 65; vein quartz 10; quartz-muscovite schist 9; metasediments 6; felsic volcanic 2; gabbro 2; intermediate volcanic 1; feldspar schist 1; porphyry 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
780	750	1.0	7.5 million

LOCATION #: 01-6 (contd.)

Muskrat Lake. North of this point the road is partly overgrown as it has been abandoned for some time. This material could be used for borrow, but due to its location, far away from existing traveled roads, its usage may be limited.

LOCATION #: 01-7

AP#: 76514-222

Type of Deposit: Ablation Till

County: Northumberland

Exposure Type: Scraping

Parish: Southesk

Status: Abandoned

UTM: 928 195

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

Cover:	3.0 m high Spruce, Tea and Moss
0.05 m Overburden:	Humus; pit in bush. Ae; grey.
0.5-1.0 m+ Gravel:	Sections in scraping. Dirty sandy gravel (some silt plastered on few pebbles); 5% boulders; 5-10% pebbles.
	Sample taken at 0.8 m+ depth
0.4 m+ Gravel:	Hand dug pit done in scraping floor. Dirty sandy gravel. Pit refusal on boulders.

This deposit, consisting of ablation till, was sampled and described from road scrapings (sites 124 and 126) and a hand dug pit (site 126). The material is a sandy till that becomes compact at depth. It contains dirty gravel pockets

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	94.2	86.4	76.5	54.4	36.7	25.5	9.5	1.9	

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 1 %	Sound Lithotypes: 99%
sandstone 1	gneiss 33; granite 32; quartz-muscovite schist 12; vein quartz 7; metasediments 6; gabbro 4; quartz-feldspar schist 2; intermediate volcanic 2; porphyry 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
225	125	1.0	1.25 million

LOCATION #: 01-7 (contd.)

and boulders. Use of this deposit may be limited by the thickness of contained material (approximately 1.0 m) and its isolated location. This deposit could be used for borrow if required.

LOCATION #: 01-8

AP#: 76514-141

Type of Deposit: Glaciofluvial outwash

County: Northumberland

Exposure Type: Scraping

Parish: Southesk

Status: Abandoned

UTM: 935 182

NTS: 21 O/1 W

SECTION DESCRIPTION & COMMENTS:

Sections in scraping show:

0.10-0.25 m Overburden: Humus and Ae (grey)

2.0-2.5 m+ Gravel: Pebbly sandy gravel (loose and clean). Cobbles less than 1%; pebbles 2-3%

Sample taken at 1.0 m+ below surface

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	97.1	94.6	88.3	80.5	67.4	29.7	8.1	2.3	0.8	0.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0 %

Sound Lithotypes: 100%

granite 39; gneiss 20; felsic tuff 10; metasediments 10; quartz-muscovite schist 10; vein quartz 7; intermediate volcanic 2; porphyry 1; gabbro 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			see 01-6

LOCATION #: 01-9

AP#: 74-509-212

Type of Deposit: Ice-contact (Esker)

County: Northumberland

Exposure Type: Roadside Pit

Parish: Northesk

Status: Abandoned

UTM: 243 251

NTS: 21 0/1 E

SECTION DESCRIPTION & COMMENTS:

2.0 m Gravel: Bouldery sandy gravel, subangular to subrounded; 30% boulders to 30 cm diameter; pebbles 20%. Fine pebbles, mainly schist fragments; coarse pebbles are sound lithologies

2.0 m+ Gravel: Pebbly sandy gravel; subangular to subrounded; 10% boulders to 30 cm diameter; 15% pebbles. Fine pebbles, mainly schist fragments

Sample taken at 2.5 m from surface

This deposit is located between Stony Brook to the north and North Sevogle River to the south. It is accessible by a good road that extends west to a ranger station and north to Sevogle Airstrip. This deposit, which is a small elongated esker-like feature, broadens and flattens at both ends.

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	83.6	80.5	79.1	70.0	48.6	32.7	16.4	6.0	2.9	1.9	1.0

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0 %

Sound Lithotypes: 100%

quartz-muscovite schist 50; metaquartzite 15; greywacke 12; vein quartz 11; gneiss 10; gabbro 1; intermediate volcanic 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
19	19	4.0	760,000

LOCATION #: 01-9 (contd.)

The sample of bouldery sandy gravel from the roadside pit is probably representative of the whole deposit. The pit is abandoned, probably because of the coarseness of the material (large boulder content). Future exploitation for borrow might require crushing of the bouldery gravel.

LOCATION #: 01-10 AP#: 76-514-235

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Road cut Parish: Northesk

Status: Undeveloped UTM: 171 219

NTS: 21 0/1 E

SECTION DESCRIPTION & COMMENTS:

0.08 m Overburden: Humus and Ae

1.0 m+ Gravel: Pebbly gravel, oxidized for top 70 cm; angular fragments; 10% coarse pebbles and cobbles to 30 cm diameter; 70% fine pebbles, 20% sand and silt. (Sample.) Underlain by rock.

This deposit is located southeast of Peabody Lake. It consists of a very thin blanket of pebbly gravel overlying rock. The material could be used locally as borrow, but its restricted thickness limits major exploitation.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	97.2	97.2	86.5	68.5	54.1	46.4	22.4	9.9	9.5	4.0	2.3

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 1%	Sound Lithotypes: 99 %
graphitic schist 1	quartz-muscovite schist 51; metaquartzite 13; gneiss 12; greywacke 11; vein quartz 4; felsic volcanic 4; quartz-biotite schist 4

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			Limited

LOCATION #: 01-11 AP#: 76-514-231

Type of Deposit: Ice-contact (Kame) County: Northumberland

Exposure Type: Gravel Pit Parish: Northesk

Status: Active on demand UTM: 097 200

NTS: 21 0/1 E

SECTION DESCRIPTION & COMMENTS:

0.08 m Overburden:	Humus and Ae
0.5 m Gravel:	Oxidized, yellow-brown, sandy gravel; 60% pebbles, 40% sand (fine-medium), some silt
0.4-0.65 m Gravel:	Pebbly gravel, pebbles to 7 cm, (rare), mainly fine pebbles; angular. Cobbles to 20 cm diameter at base.
0.5 m Gravel:	Lens of sandy gravel, angular, medium to very coarse sand and fine gravel
	(Sample A)
2.0 m Gravel:	Pebbly gravel with 5% cobbles to 20 cm diameter, 70% pebbles, 25% medium to very coarse sand

(CONTINUED)

MECHANICAL ANALYSIS:

sieve		31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	A	82.2	82.2	79.0	72.9	60.0	42.5	24.9	9.5	6.8	1.4	0.9
	B	100.0	87.3	75.8	53.9	25.0	11.3	6.8	5.0	4.0	2.7	1.8
	C	96.3	96.3	91.2	82.4	74.5	61.9	39.1	11.1	7.0	3.2	1.8
	D		100.0	90.2	70.5	51.9	33.3	19.1	9.8	8.0	4.0	2.0

LITHOLOGIC ANALYSIS: See following page for analysis of Samples B,C and D.

Unsound Lithotypes: 0%	Sound Lithotypes: 100 %
A	quartz-muscovite schist 83; vein quartz 6; gneiss 4; metaquartzite 2; greywacke 2; granite 1; porphyry 1; felsic volcanic 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
25	17	20	3.4 million

LOCATION #: 01-11 (contd.)

0.3 m Gravel:	Sandy fine gravel similar to sample A
1.5 m Gravel:	Cobbly gravel, 20% cobbles to 20 cm diameter, 60% pebbles, 20% sand
2.0 m Gravel:	Fine pebbly gravel, mainly platy fragments up to 1 cm diameter, some coarse to very coarse sand
14.0 m Gravel:	Pebbly gravel, 15% cobbles and boulders to 30 cm diameter, 60% pebbles, 25% coarse to very coarse sand, well stratified, dipping to east
	(Sample B was taken 6.0 m from top of unit)
0.5 m Gravel:	Fine pebbly gravel, some coarse sand
	(Sample C)
2.0 m Sand:	Sand medium, clean, with pebbly layers
1.0 m Gravel:	Pebbly gravel similar to Sample B
5.0 m Gravel:	Sandy pebbly gravel
	(Sample D was taken in top part of unit)

This deposit is located southwest of Peabody Lake on Clearwater Stream. This ice-contact kame is the most important deposit on NTS map sheet 21 0/1. Although limited in extent, it is very thick. Approximately 70,000 m^3 of material have already been removed. Four samples were collected and analyzed from the present pit. They are considered representative of the gravelly units noted in the pit. The pebble count indicated that lithotypes were sound, except for 1 sandstone, 1 vein quartz and 1 graphitic schist. This deposit has excellent potential as a source of granular material for borrow or crushing. The road to the deposit from the north is very poor, but better to the south, although it would need to be upgraded close to the deposit because of washouts.

The only serious limitation to future exploitation of this deposit is its distance from areas of potential need for aggregate. Also, the fact that most coarse clasts are coated with iron-hydroxides and pyrolusite might limit the use of this material.

LOCATION #: 01-11 (contd.)

LITHOLOGIC ANALYSIS: (contd.)

Unsound Lithotypes: 1%	Sound Lithotypes: 99%
B sandstone 1	quartz-muscovite schist 68; vein quartz 9; phyllite 8; granite 6; metaquartzite 3; greywacke 2; gabbro 2; intermediate volcanic 1
Unsound Lithotypes: 0%	**Sound Lithotypes: 100%**
C	quartz-muscovite schist 78; vein quartz 8; greywacke 7; felsic volcanic 5; granite 1; mafic volcanic 1
Unsound Lithotypes: 2%	**Sound Lithotypes: 98%**
D vein quartz 1; graphitic schist 1	quartz-muscovite schist 71; vein quartz 11; felsic volcanic 5; granite 3; intermediate volcanic 3; greywacke 3; metaquartzite 2

LOCATION #: 01-12 AP#: 75510-130

Type of Deposit: Colluvium County: Northumberland

Exposure Type: Roadside scraping Parish: Northesk

Status: Undeveloped UTM: 984 290

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

Cover:	Pine, Tea, Moss
0.15 m Overburden:	Black organic humus
0.12 m Ae:	Grey Ae (gritty sand)
0.15 m Sand:	Dark brown oxydized pebbly sand
0.1 m Sand:	Olive-brown loose gritty granite sand
0.4 m+ Sand:	Olive-brown compact granite sand (pebbles pink feldspar)
	Sample taken at 0.75 m depth

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing				100.0	92.2	70.1	48.9	33.1	24.1	17.6	12.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: N.A. %	Sound Lithotypes: N.A. %
No pebbles	No pebbles

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
1340	670	1.0	6.7 million

LOCATION #: 01-12

This deposit, which is located in the vicinity of Big Bald Mountain, consists of colluvium or regolith. Hand dug pits (sites 141 and 144) and road sections (sites 142, 143 and 145) show that colluvium is present around Big Bald Mountain, especially to the east, in good thicknesses (1.0 to 1.5 m) but tends to thin towards the top of Big Bald Mountain (site 276). The deposit essentially forms a blanket over the existing topography. The colluvium seems to consist primarily of weathered and disintegrated local bedrock moving downslope through mass wastage. In some places, the colluvium may be associated with reworked till moving downslope through creep. This deposit may be relatively important as a possible source of aggregate because of its large size.

Three samples were taken from different localities (01-12, 01-47, 01-48) within this deposit and are considered representative of the material. The potential of this deposit may be limited by its poor gradings. In addition, its durability, soundness and resistance to breaking upon loading may be poor because it is composed primarily of mineral grains from disintegrating bedrock. Further testing to evaluate these properties will be required to qualify the deposit for specific usage other than general fill.

LOCATION #: 01-13 AP#: 74510-80

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Road cut and Scraping Parish: Northesk

Status: Abandoned UTM: 035 319

NTS: 21 O/1 W

SECTION DESCRIPTION & COMMENTS:

0.07 m Overburden:	Humus and Ae
1.0-1.3 m Gravel:	Pebbly fine gravel, brown; 20% pebbles to 3 cm diameter, 20% coarse and very coarse sand; all subangular to subrounded. Much potassium feldspar and plagioclase in coarse sand.
2.0 m± Gravel:	Pebbly fine gravel, brown; 100% pebbles to 10 cm diameter. Granules and coarse to very coarse sand; all subangular to subrounded. (Sample)
0.50 m Till:	Olive brown, sandy, trace silt; 25% cobbles and boulders to 30 cm diameter

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing			100.0	94.4	83.1	45.9	13.7	5.2	4.2	2.3	1.2

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 4%	Sound Lithotypes: 96 %
schist 3; tuff 1	granite 44; diorite-gabbro 14; gneiss 10; quartz-muscovite schist 10; greywacke 7; felsic volcanic 4; vein quartz 3; tuff 2; metaquartzite 1; porphyry 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
6	6	2.5	150,000

LOCATION #: 01-13

This deposit, which is located north of the North Sevogle River, consists primarily of pebbly fine gravel with boulders up to 2.0 m diameter in places. The top of the deposit is flat to gently sloping. Some of the deposit has been used for local road construction, and the remaining material could be similarily utilized.

LOCATION #: 01-31 AP#: 81016-48

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Road cut Parish: Northesk

Status: Undeveloped UTM: 916 338

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

0.03-0.05 m Overburden: Humus and Ae, grey, well developed

0.3-0.5 m Gravel: Brown pebbly gravel, 80% pebbles to 8 cm diameter, 20% sand, all rounded

0.7 m Gravel: Pebbly fine gravel, 30% pebbles to 8 cm diameter, 70% coarse sand and granules, few cobbles, all rounded. (Sample)

This deposit, which is located on the west side of the South Nepisiguit River, consists of pebbly sandy gravel. The deposit has a limited extent. Irregular relief of the underlying bedrock surface could further limit its depth.

The sample is considered representative of the lower part of the deposit. The material in this deposit is adequate for local use.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing			100.0	90.3	81.9	67.4	46.0	20.3	8.3	4.5	2.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 9 %	Sound Lithotypes: 91 %
phyllite 7; schist 1; metasediments 1	quartz-muscovite schist 18; gneiss 16; tuff 14; metaquartzite 11; vein quartz 10; felsic volcanic 9; metasediments 8; granite 2; gabbro 2; greywacke 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
12	9	1.0	90,000

LOCATION #: 01-32 AP#: 81016-48

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Gravel Pit Parish: Northesk

Status: Abandoned UTM: 919 323

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

Top of section removed

1.0-2.0 m Gravel:	Pebbly gravel; poorly stratified, 90% pebbles to 8 cm diameter, rare cobble to 15 cm diameter, 10% coarse sand, includes 20 cm x 2.0 m lenses of medium to coarse sand
1.0 m Gravel:	Very loose, pebbly fine gravel (sample)
4.0 m Slump Covered:	Assumed to be pebbly gravel

This deposit, which is located west of the South Nepisiguit River, consists of pebbly gravel with sand lenses. It is quite extensive, but poorly drained in areas adjacent to the Lower South Nepisiguit River. The analyzed sample is considered representative of the exposed part of the deposit. Approximately

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing			100.0	83.1	63.2	43.5	25.7	7.5	2.2	1.2	0.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0%	Sound Lithotypes: 100%
	quartz-muscovite schist 45; vein quartz 20; metasediments 13; granite 6; diorite-gabbro 5; greywacke 4; gneiss 3; felsic volcanic 2; tuff 2;

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
60	30	2.0	600,000

LOCATION #: 01-32 (contd.)

70,000 m^3 of material have been removed. The deposit is an adequate source of material for local use.

LOCATION #: 01-33

AP#: 81014-154

Type of Deposit: Colluvium

County: Northumberland

Exposure Type: Road cut

Parish: Northesk

Status: Undeveloped

UTM: 931 285

NTS: 21 O/1 W

SECTION DESCRIPTION & COMMENTS:

0.1 m Overburden:	Humus, black
0.05 m Sand:	Very oxidized, pebbly medium sand, dark chocolate brown, cemented
0.15 m Sand:	Dark brown, oxidized, pebbly silty sand not as cemented as layer above
0.45 m Till:	Olive brown, pebbly sandy till, some silt becoming compact with depth
0.2 m Granite:	Pebbly granitic sand, layered horizontally
0.2 m Grantie:	Rotten granite

(CONTINUED)

MECHANICAL ANALYSIS: N.A.

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing											

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes: %	Sound Lithotypes: %

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
220	220	2.0	4.4 million

LOCATION #: 01-33 (contd.)

This deposit, which is located southwest of Big Bald Mountain, consists of colluvium or regolith. The material is comparable to 01-12 and will require similar laboratory testing before utilization. Subject to testing, this deposit could be a source of material for borrow, road subbase and building pads.

LOCATION #: 01-47

AP#: 75510-129

Type of Deposit: Weathered Granite

County: Northumberland

Exposure Type: Road cut

Parish: Northesk

Status: Undeveloped

UTM: 978 287

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

0.20 m Overburden:	Organic material and Ae horizon; grey, fine to medium, angular sand with some granules
0.20 m Weathered Granite:	(Colluvium) orangy-brown, Fe-hydroxide cemented weathered granite; mainly medium to coarse sand and some small pebbles. (Sample)
0.40 m Weathered Granite:	(Colluvium), brown angular coarse to very coarse sand and fine pebbles; 5% pebbles up to 3 cm in diameter

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing			100.0	96.9	75.9	55.2	31.3	19.3	12.6	5.0	2.2

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 9 %	Sound Lithotypes: 91 %
felsic volcanic 4; metasandstone 3; hornfels 2	granite 83; vein quartz 3; felsic volcanic 2; gneiss 1; quartzite 1; hornfels 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			See 01-12

LOCATION #: 01-48

AP#: 75510-129

Type of Deposit: Colluvium/Till

County: Northumberland

Exposure Type: Hand Dug Pit

Parish: Northesk

Status: Undeveloped

UTM: 981 305

NTS: 21 0/1 W

SECTION DESCRIPTION & COMMENTS:

0.08 m Overburden:	Humus and Ae horizon
0.04 m Sand:	Orangy-brown, silty pebbly sand
0.08 m Colluvium:	Colluvium-fine pebbly gravel composed of quartz, potassium feldspar and plagioclase
0.30 m+ Till:	Till, sandy, trace silt; 20% fine pebbles, mainly medium sand. Subangular to very angular. (Sample)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	97.1	94.7	81.8	70.7	56.1	37.1	24.1	23.6	9.4	4.9

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 27 %	Sound Lithotypes: 73 %
sheared felsic volcanic 14; sheared intermediate volcanic 8; sandstone 3; shale 1; biotite schist 1	intermediate volcanic 16; vein quartz 12; granite 11; metaquartzite 8; felsic volcanic 8; gneiss 6; hornfels 5; gabbro 4; schists 2; porphyry 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			See 01-12

APPENDIX B

SUPPLEMENTARY FIELD OBSERVATIONS
BIG BALD MOUNTAIN
(NTS 21 0/1)

BIG BALD MOUNTAIN

101 UTM 275 150

Roadside section: dark, olive-brown, stony sandy till, 0.5-1 m+ thick, 10% pebbles, compact, very compact with depth, boulders to 20 cm diameter are angular to subangular, some 15-20% silt, some very coarse sand. Water in ditch - probably high water table.

102 UTM 210 104

Road scraping in till as at 101: 0.5-0.8 m of sandy till over rock (phyllitic schist, highly deformed). Many fragments of rock in the scraping, rock poorly exposed.

103 UTM 188 100

Striae: younger - 066°(trend), older if real 178°(trend), on silicified phyllite; 0.3-0.5 m thick olive brown, sandy stony till.

104 UTM 160 103

Small roadside pit: 15.0 m x 7.0 m, x 1.0 m deep: 0-0.35 cm oxidixed orangy red sand, medium gravel: 0.35-0.65 m olive-brown, pebbly fairly compact sand, angular, medium-coarse grained (washed till?); 0.65-1.15 m+ till, silty stony till, olive brown.

105 UTM 077 081

Some silt plastered on pebbles: 1.5 m yellow brown, very sandy ablation till, pebbles subangular to sub-rounded, 15% cobbles to 15 cm diameter, trace silt.

106 UTM 072 090

Pit-scraping: yellow-brown sandy ablation till, 2.0 m+ thick, 15-20% cobbles, local use as borrow. (2000 m^3 removed) .

107 UTM 069 097

Scraping along road show: 0.4-0.5 m of sandy ablation till over, 0.1-0.2 m+ sandy silty till (10% silt), numerous cobbles on surface to 30 cm diameter.

108 UTM 043 103

Small scraping at side of road: 1.0 m oxidized, pebbly coarse sand,

angular over 0.3-0.5 sandy till, boulders to 1.5 m diameter over rock - gneissic. Very small deposit, restricted on location, access, boulders and thickness.

109 UTM 032 099

Large scraped area done by logging company looking for gravel: none removed because too coarse and thin. A large proportion of this deposit would have a high water table, therefore not a usable source. Typical section: 0-10 cm organics; 10-20 cm Ae, grey, well developed; 20-40 cm cobbly sandy gravel, cobbles to 20 cm diameter; 40 cm cobbly gravel, 60% cobbles and 40% pebbles and coarse sand - may be washed till; surface topography - flat, covered with spruce, labrador tea, moss, some jack pine.

110 UTM 049 112

2.0-3.0 m sandy stony till over rock (pyrite bearing metasandstone schist) road scraping on side of hill: material probably used to build road.

111 UTM 034 122

Abandoned pit: (5.0 m deep at deepest part) 0.5-1.0 m sandy till over broken rock (serecite-quartz) schist - unsound, highly deformed, some silicification as quartz veins. Two phases of folding apparent - one very tight. (6000 m^3 removed.)

112 UTM 998 144

Road cut shows: very coarse sand and very fine gravel, 15% > 1 cm diameter, no silt. (3600-7200 m^3 removed.)

113 UTM 992 149

0.5-1.0 m pebbly sandy gravel over till: few boulders to 2.5 m diameter, 10%-15% cobbles up to 25 cm diameter. Maximum 4,500-9,0000 m^3 of usable material for local use. Restricted on size and thickness. (750-1500 m^3 removed).

114 UTM 115 138

Borrow pit, abandoned: yellowish brown sandy till, some silt, 10% boulders to 0.8 m diameter, 15% pebbles. (5,000 m^3 removed)

115 UTM 092 142

Abandoned pit: 6,000 m^3 of pebbly sandy gravel has been borrowed; pit

floor shows medium-fine sand (1.0-1.5 m above water table). Should not be considered as a resource pit (depleted).

116 UTM 054 165

Road cut: 2.0 m bouldery cobbly gravel, with coarse sand and fine pebble matrix. No silt, finer fraction is subangular, coarse fractiom is subangular to subrcunded; 15% boulders to 70 cm diameter, 20% cobbles, 30% sand.

117A UTM 037 198

0.3-0.5 m pebbly gravel over 2.0-2.5 m interbedded fine sand and silt: beds 1 cm thick at top, becoming thicker and finer at depth, possibly some clay. Use of gravel restricted by thickness.

117B UTM 035 198

Same as 117A.

117C UTM 035 201

0.5-0.75 m sand and gravel.

118 UTM 033 207

Section 1: 3.0 m+ very bouldery sandy till. Section 2: (composite section) 500 m north of section 1: 0.3-0.5 m sandy gravel over 1.0-1.3 m sand over 0.5-2.5 m till, bouldery, sandy.

119 UTM 941 269

Up to 5.0 m of deeply weathered granite, or colluvium comprised of boulders. (2.0-3.0 m diameter) and coarse sand (angular) sized material. Material probably good for borrow, subbase etc. if boulders removed. Material will probably break up under compression - should be tested for physical and mechanical properties before assessing for use as aggregate. Some small areas of sand may occur along stream.

120 UTM 937 278

Borrow pit: small. Backwall shows 0.5-1.0 m of weathered rock over 2.5 m of broken rock over 1.2 m of more competant rock. With depth rock becomes more competant with red colour. (12,000 m^3 removed)

121 UTM 904 208

Boulder layer at surface of small road side exposure (boulders up to 50 cm diameter-white granite): 50 cm of pebbly coarse sand over 30 cm very compact sandy ablation - till (no stones in till). Surface cover of spruce, labrador tea, moss.

122 UTM 909 205

Small roadside scraping shows: 2.0-2.5 m+ pebbly sandy gravel (1-2% boulders, 3-5% cobbles); gravel is very clean, same as 01-6.

123 UTM 910 205

Small roadside scraping shows: 3 cm humus over 20 cm Ae, grey over 20 cm very cemented gravel over 2.0-2.5 m+ pebbly fine gravel (sandy), very clean, very loose, very few boulders.

124 UTM 915 202

Small roadside scraping shows: 3 cm humus over 1.0 m+ pebbly fine gravel (sandy), (1-2% boulders, 3-5% cobbles), over 3.0 m+ olive brown very compact sandy ablation till. (Surface cover-spruce 8.0 m high, labrador tea and moss.)

125 UTM 922 197

Pit in bush: 5 cm humus over 10 cm grey Ae over 10-15 cm well cemented layer (impossible to dig through it). Small road scraping shows; 0.5-0.8 m+ sandy loose till (ablation) over 0.3 m+ compact stony sandy till (5% boulders up to 0.6 m diameter) (Surface cover-spruce 5.0-7.0 m high, labrador tea and moss.)

126 UTM 932 192

Small road scraping shows: 0.8-1.0 m+ sandy ablation till (compact) (2% cobbles).

127 UTM 943 166

Small pit shows: 10 cm humus over 20 cm Ae (grey) over 20 cm very compact stony sandy ablation till. (Surface cover - spruce, tea, moss.)

128 UTM 948 159

Pit in bush: 3 cm humus over 5 cm Ae (grey). Small scraping shows: 0.5-0.8 m+ loose sandy gravel over possible rock. Gravel contains

abundance of shist angular-subangular fragments (3% boulders, 5% cobbles). Surface cover - pine 8.0 m high, tea, moss.

129 UTM 955 149

Section shows: 5 cm humus over 5 cm Ae grey over 30 cm loose sandy till (ablation). Broken limestone mixed with till. (Surface cover - spruce and tea.)

130A UTM 972 102

Small road section on new logging area shows: 3 cm humus over 25 cm Ae grey over 2.0 m+ very compact stony sandy till. Boulders up to 1.0 m diameter (white granite).

130B UTM 975 105

Scraping shows: 1.0 m+ stony sandy till. Boulders numerous, 1 up to 1.5 m diameter.

131 UTM 038 091

Small section shows: 10 cm black humus over 12 cm Ae (grey) sandy over 35 cm oxidized (compact with depth) stony sandy till over 10 cm compact olive brown stony sandy till, no gravel. (Surface cover - spruce, alders and tea.)

132 UTM 275 256

0-0.5 m pebbly sandy gravel: could be pushed material over 1.0-1.3 m compact stony sandy till, olive-brown (5-10% boulders to 0.5 m diameter, 15% pebbles, subangular, round, granites).

133 UTM 248 251

1.0 m pebbly gravelly drift: some sand over 0.5 m+ till. The drift here has been used as borrow, it is loose, and mainly composed of unsound schist fragments, although some granitic pebbles are present. Because of high content of unsound lithologies this material is not a good source of aggregate.

134 UTM 245 250

Abandoned roadside pit: no good sections; cobbly pebbly gravel (15% cobbles to 30 cm diameter, 15-20% pebbles; 20% sand; may be more material available at depth, but limited (2,000 m^3 removed).

135 UTM 222 250

Road cut: 1.0-2.5 m cobbly pebbly gravel (20% cobbles and boulders to 0.5 m diameter; 25% pebbles; same as 01-9 over 0.8-1.5 m till, stony sandy.

136 UTM 179 234

Abandoned pit: 2.0 m+ pebbly sandy gravel, rare boulder to 2.0 m diameter (2% cobbles; 65% stones; 30% pebbles; subangular) probably overlies rock (10,000 m^3 removed).

137 UTM 180 230

10 cm humus over 20 cm Ae over 80 cm pebbly sandy gravel (top 30 cm oxidized; 15% pebbles to 10 cm diameter over 35 cm pebbly sand over 30 cm fine pebbly gravel (5-10% pebbles to 10 cm diameter maximum) over 5-10 cm silt and fine sand over 50 cm fine pebbly sand over 1.0 m covered.

138A UTM 089 182

Abandoned pit: glaciofluvial outwash; 2.0 m pebbly gravel, trace sand and silt. Few boulders to 50 cm diameter. Most fragments are of schist and are platey.

138B UTM 086 179

Abandoned pit: glaciofluvial outwash; 4.0 m of gravel, as at 138A, 2 boulders up to 2.0 m diameter of white granite are present (1200 m^3 of material has been removed from the deposit).

139 UTM 140 144

Road cut in alluvial terrace: 2.0 m interbedded medium and fine sand, up to 10% pebbles. Top 50 cm is oxidized; top 10 cm cemented with limonite.

140 UTM 163 131

Old borrow pit in rock (granitic gneiss) shows: 0.5 m+: medium coarse sand over 0.5 m+: stony sandy compact till over 2.0-3.0 m+: granitic gneiss.

141 UTM 981 285

Hand dug pit beside road shows: 5-10 cm humus over 5 cm grey Ae over 10 cm pebbly gritty sand, dark reddish brown, oxidized over 20 cm pebbly

gritty sand olive-brown over 50 cm compact pebbly sandy ablation till, silt plastered on subangular-angular pebbles (Surface cover - pine and labrador tea).

142 UTM 979 272

Small section along road shows: 1 cm humus over 5 cm grey Ae over 0.5 m+ pebbly coarse sand (few stones), four boulders up to 0.5 m diameter on surface (Surface cover - spruce, labrador tea and moss).

143 UTM 984 290

Small section along drainage ditch shows: 1-2 cm humus over 5-8 cm Ae grey over 0.8 m+ loose orange-brown sand (pebbly, with silt) over 0.2 m+ compact pebbly silty sand (granite sand). Abundant feldspar grains (Surface cover - pine and spruce).

144 UTM 988 291

Small pit beside road shows: 3 cm humus over 5-8 cm+ Ae grey (gritty sand) over 0.3-0.5 m+ pebbly sand (granite sand) (Surface cover - pine and labrador tea).

145 UTM 996 299

Small section along road shows: 3 cm humus over 5-8 cm Ae grey (gritty sand) over 15 cm dark brown, cemented oxydized, pebbly, sand over 0.2 cm light brown sand over 0.4-0.5 cm rotten pink granitic sand. This entire area of rotten granite (granitic sand) would probably be a good borrow source. Abrasion or crushing test should be made before further comment! (Surface cover - pine and labrador tea.)

146 UTM 000 304

Small roadside scraping shows: 0.3 m+ reddish oxidized loose stony sandy drift over 0.2 m+ olive-brown compact stony sandy till. (Boulders up to 0.8 m in diameter). White granites.

147 UTM 002 311

Small road section shows: 0.8 m+ loose sand over 0.3 m+ compact stony sandy till (boulders up to 0.5 m diameter-white granite).

148 UTM 014 323

New road cut shows: 0.3 m+ oxidized orangy brown loose stony sandy ablation till over 1.0 m+ brown compact stony sandy till over 1.0-1.2 m+ rock. Boulders (white granite up to 2.0 m diameter).

149 UTM 033 316

Actual pit shows: 4.0 m+ shale (using shale as aggregate). Small stockpile contains: 2,500 m . Resource almost unlimited as borrow.

150 UTM 022 287

Small scraping along new road shows: 2.0 m+ stony sandy till over rock. No signs of gravel within this area.

151 UTM 051 331

Abandoned pit: 4.0 m till, olive brown, sandy, stony, boulders to 1.0 m diameter (white granite). Probably overlies rock, no good sections. More material available for borrow, could be reopened on demand. (22,500-45,000 m^3 removed)

153 UTM 154 297

Abandoned borrow pits in the Sevogle airport area shows: 1.0 m stony sandy till over 2.0 m rock. The airport runway and roads are built on a subbase of till and bedrock.

154 UTM 163 289

Hand dug hole shows: 8 cm humus over 5 cm Ae grey sandy till over 35 cm stony sandy, loose ablation till. In places, 30-40 cm of dirty gravel overlies the till as seen in the road cuts.

155 UTM 175 283

Borrow pit: abandoned, depleted; 1.0 m pebbly sandy gravel. East of creek, the pit floor is on rock.

242 UTM 910 348

road cut: 5 cm humus, black over 3 cm Ae grey, well developed over 15 cm very dark reddish brown oxidized sand over 1.0 m loose stony sandy drift. Several lithologies present (granite, schist, volcanics, etc.)

243 UTM 925 304

Road cut: 4.0 m drift very stony - broken rock.

274 UTM 911 226

Hand dug hole: 10 cm humus; 20 cm Ae; 20 cm B; 10.0 m+ till, hard, compact pebbles to 2 cm., brown, silty, many granitic fragments.

275 UTM 913 227

Several hand dug holes in ridges show: 5 cm humus; 50 cm Ae - contains some fragments of schist, but mainly rotten granite; very silty with some clay; 20 cm+; cobbles and angular sand, fine pebbles and granules of granite, potassium, feldspar, plagioclase and quartz, very little silt. Boulders are rare on the surface considering the monolithic nature of the lowest unit, I would tend to consider it rotten granite or an ablation till derived from it.

276 UTM 952 298

Top of Big Bald Mountain is 10% bare rock (pink granite) with 0-0.3 m grus in the areas between the tors and areas of bare rock. On the way up the hill, the grus gets thinner with altitude. Only in the low areas where colluvium would have thickened the deposit, would there be sufficient material to warrant exploitation.

LOCATION #: 02-34

AP#: 75-501-56

Type of Deposit: Weathered Granite

County: Northumberland

Exposure Type: Road cut - scraping

Parish: Southesk

Status: Undeveloped

UTM: 866 085

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

Top Removed

0.3 m Granite: Dark brown, partially cemented, oxidized granite, breaks up into 1 cm chunks

1.7 m Granite: Granite grus, mainly angular fragments 0.5 cm diameter

0.5 m Granite: More competent granite, white

This deposit, which is located south of Sinclair Lake, consists of weathered granite. It is comparable to the material examined near Big Bald Mountain to the east. This deposit has limited economic value because of its restricted extent.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing			100.0	98.7	89.5	66.0	43.7	25.5	14.3	8.1	4.2

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes: %	Sound Lithotypes: %

ESTIMATION OF RESERVES: N.A.

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable

LOCATION #: 02-35

AP#: 76-514-047

Type of Deposit: Ice-contact (Esker)

County: Northumberland

Exposure Type: Gravel pit

Parish: Southesk

Status: Abandoned

UTM: 793 153

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

0.07 m Overburden: Humus, black

0.17 m Gravel: Ae, grey, pebbly gravel

0.17 m Gravel: Oxidized, brown, coarse sandy gravel

0.20 m Gravel: Orangy brown, oxidized pebbly sandy gravel

1.1 m Gravel: Cobbly gravel, 40% cobbles to 25 cm diameter, few boulders to 40 cm diameter, 30% pebbles, 30% medium to coarse sand, more bouldery with depth

0.08 m Sand: Stratified fine to medium sand

1.5 m Gravel: Pebbly sandy gravel, loose, 5% boulder, 10% cobbles, 85% pebbles and sand (sample)

2.5 m Slump Covered: Assumed to be pebbly sandy gravel

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	91.7	91.7	83.0	71.1	56.5	39.5	23.5	9.8	3.7	1.8	0.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 2 %	Sound Lithotypes: 98 %
sandstone 1; biotite schist 1	granite 57; gabbro 12; gneiss 9; intermediate volcanic 8; greywacke 4; metaquartzite 2; tuff 2; metasandstone 2; vein quartz 1; felsic volcanic 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
305	150	4.0	6 million

LOCATION #: 02-35 (contd.)

This deposit, formed by an esker, extends from Lower Graham Plains (west of Gover Lake) to Mitchell Lake. The analyzed sample was taken in a pit located southeast of Mitchell Lake where the road to Lizard Lake cuts the esker. The sample is considered representative of the gravels exposed in the pit. Some abrupt changes in grain size and degree of sorting may be expected as stratification within ice-contact deposits is commonly sorted and faulted. The extreme variability in grain size, grading and sorting might have a direct impact on the potential of the material for specific aggregate usage. More testing will be required (sampling of various segments of the esker) to completely evaluate this deposit. Material examined in the actual borrow pit is suitable for borrow and has good potential for screening and crushing.

The probable recoverable reserves of this deposit are in the order of 6 million m^3. A small amount of material, approximately 4,800 m^3, has already been removed from the deposit.

LOCATION #: 02-36

AP#: 75-501-58

Type of Deposit: Alluvium

County: Northumberland

Exposure Type: Gravel Pit

Parish: Southesk

Status: Abandoned

UTM: 900 089

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

Top removed

0.03 m Overburden:	Ae, grey
0.3 m Gravel:	Pebbly sandy gravel, 30% pebbles, most 3-4 cm diameter
1.0 m Sand:	Pebbly coarse sand
0.5 m Gravel:	Pebbly sandy fine gravel, pebbles and medium sand, all rounded, clean, well stratified (sample)
0.2 m Sand:	Coarse sand
1.0 m Slump Covered:	Assumed to be sand

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	93.0	89.8	81.4	68.4	48.2	27.3	9.0	3.1	1.7	0.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 1 %	Sound Lithotypes: 99 %
biotite schist 1	granite 74; gneiss 11; metasandstone 4; metaquartzite 3; vein quartz 3; intermediate volcanic 2; gabbro 2

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
174	131	1.0	1.31 million

LOCATION #: 02-36 (contd.)

This deposit, located along North Pole Stream, consists of alluvium. The material is stratified pebbly sandy gravel and sand. Fine sand, silt and clay with variable organic contents and deleterious material might occur within the deposit and limit its use. Poor drainage in some areas (high water table) could also limit its potential for future exploitation as aggregate. Approximately 7,200 m^3 of material have already been removed for local use.

LOCATION #: 02-37

AP#: 76-514-050

Type of Deposit: Glaciofluvial outwash

County: Northumberland

Exposure Type: Gravel Pit

Parish: Southesk

Status: Abandoned

UTM: 849 143

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

0.02-0.08 m Overburden: Humus and Ae, grey

2.0 m Gravel: Pebbly sandy gravel, 95% sand and pebbles, 5% cobbles and boulders to 1.5 m diameter

2.0 m Slump Covered: Assumed to be pebbly sandy gravel

Sample taken at 2.0 m from surface

This deposit, which consists primarily of outwash, is primarily located north of Sinclair Lake on the south side of North Pole Stream. A small area of outwash north of North Pole Stream is also included. It consists of pebbly sandy gravel. The sample is considered representative of the south part of the deposit adjacent to Sinclair Lake. The deposit is accessible by road and is quite extensive. Although all examined pebbles were noted as being sound, the deposit's potential for most purposes may be limited by its poor grading.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	93.4	90.5	84.2	73.2	44.3	19.5	6.5	3.0	1.9	0.9

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0 %	Sound Lithotypes: 100 %
	granite 73; metasediments 7; metaquartzite 7; gabbro 5; quartz-muscovite schist 3; vein quartz 3; gneiss 2

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
118	118	2.0	2.36 million

LOCATION #: 02-38 AP#: 76-514-052

Type of Deposit: Ice-contact (Esker) County: Northumberland

Exposure Type: Road cut Parish: Southesk

Status: Undeveloped UTM: 897 141

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

0.1-0.2 m Overburden: Humus and Ae, grey, well developed

0.2 m Gravel: Pebbly gravel

6-8 m Sand: Pebbly coarse sand (very fine gravel) very uniform 10% rounded pebbles, 45% granules, 45% sand (sample)

This deposit is located mainly east of Sinclair Lake. It is formed by three bodies of granular material dissected by North Pole Stream. The deposit is formed by an esker complex of variable height and width. The examined road-cut shows primarily uniform coarse sand. The gravel horizon examined in the road cut is thin. However because the deposit is of ice-contact origin, extreme variability might be expected for grain size, grading and sorting throughout the deposit. The analyzed sand would appear to qualify as fine aggregate with little modification. This deposit has good potential for borrow, and probably other aggregate, based on material examined and the vastness

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	98.2	94.5	88.0	62.2	27.9	7.1	2.4	1.2	0.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 3 %	Sound Lithotypes: 97 %
granite 3	granite 71; metasediment 11; greywacke 6; metaquartzite 6; gneiss 1; gabbro 1; vein quartz 1;

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
186	60	6.0	3.6 million

LOCATION #: 02-38 (contd.)

the deposit. It is difficult to give an estimate of materials available for specific purposes until more detailed sampling and testing is completed. The probable recoverable reserves estimate should be used with restraint.

LOCATION #: 02-39 AP#: 75-501-40

Type of Deposit: Ice-contact (Esker) County: Victoria

Exposure Type: Gravel Pit Parish: Lorne

Status: Abandoned UTM: 545 105

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

Surface disturbed

0.2-0.4 m Sand:	Oxidized, brown pebbly silty sand
1.5-2.0 m Gravel:	Brown pebbly gravel, 5% boulders to 40 cm diameter, 70% pebbles, 25% sand
0.5 m Gravel:	Pebbly gravel; loose, 65% pebbles, 35% granules and coarse sand
6.0 m Slump Covered:	Assumed to be as above
0.5 m Gravel:	Pebbly sandy gravel, 30-35% pebbles, 65-70% sand and granules (sample)
7.0 m Slump Covered:	Assumed to be pebbly sandy gravel

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	75.9	53.6	39.2	28.9	21.5	12.3	4.8	2.0	0.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 4 %	Sound Lithotypes: 96 %
metasediments 4	greywacke 57; metaquartzite 19; metasediments 6; gabbro 4; intermediate volcanic 4; felsic volcanic 3; granite 2; vein quartz 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
75	40	15	6.0 million

LOCATION #: 02-39 (contd.)

This deposit, which is located north of Trouser's Lake, consists of pebbly sandy gravel. Approximately 18,000 m^3 have been removed. Some of this material was probably screened as is suggested by stone piles in the pit. The material in the deposit is good for screening and crushing but attention should be given to the fact that unsound lithotypes were noted in the pebble count. Because the origin of the material is ice-contact, variability in grain size, grading and sorting might be expected throughout the deposit.

LOCATION #: 02-40

AP#: 75-501-41

Type of Deposit: Ablation Till

County: Victoria

Exposure Type: Road cut

Parish: Lorne

Status: Undeveloped

UTM: 571 090

NTS: 21 O/2

SECTION DESCRIPTION & COMMENTS:

0.03-0.08 m Overburden: Humus; Ae, grey, well developed

1.0 m Till: Very sandy ablation till (similar to very coarse granitic sand) few boulders and cobbles to 20 cm diameter, 5% pebbles, 95% medium to coarse sand to fine gravel

This deposit, consisting of ablation till, is very extensive and covers much of the lower third of the Serpentine Lake map area. Ablation till is usually described as being poorly sorted and containing variable amounts of different particle sizes including clay, silt and boulders. Road cuts indicated that the material is generally free of, or at the most contains only minor amounts of, silt and clay. Cobbles and boulders are common. In some areas, they are even more concentrated. Numerous areas are present where boulders are concentrated within the ablation till and are noted on the map as being "very bouldery". The boulders

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	96.6	94.5	90.8	84.4	69.9	52.9	33.8	16.2	8.7	3.9

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 9 %	Sound Lithotypes: 91 %
granite 9	granite 87; gabbro 2; greywacke 1; metaquartzite 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
10,000	7,000	3.0	210 million

LOCATION #: 02-40 (contd.)

in these areas could be utilized as rip rap. The ablation till could be used for borrow, crushing and screening, but further field testing and sampling should be completed to outline the best materials for these purposes.

The probable recoverable reserves may be much more than indicated in the estimates. The hummocky nature and relief (up to 15.0 m) of the moraines in which the ablation till is contained suggest that the ablation till may be in excess of 10.0 m thick over large areas.

LOCATION #: 02-41

AP#: 76-514-122

Type of Deposit: Glaciofluvial outwash

County: Victoria

Exposure Type: Gravel Pit

Parish: Lorne

Status: Abandoned

UTM: 591 141

NTS: 21 O/2

SECTION DESCRIPTION & COMMENTS:

Top scraped

0.5 m Overburden: Ae

0.86 m Gravel: Oxidized pebbly gravel, orangy brown, partially cemented

0.3 m Gravel: Pebbly gravel, 95% pebbles, few cobbles and boulders to 35 cm diameter

0.3 m Gravel: Pebbly fine gravel

2.0 m Slump Covered: Assumed to be gravel

1.0 m Gravel: Pebbly fine gravel, very dirty; silt plastered on the pebbles, all rounded, poorly stratified, coarse pebbly and pebbly sand layers (sample)

2.0 m Slump Covered: Assumed to be as above

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	91.2	77.2	58.4	35.3	17.0	7.7	4.2	3.0	1.9	0.9

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0 %

Sound Lithotypes: 100 %

metaquartzite 52; metasediments 13; greywacke 12; quartz-muscovite schist 6; vein quartz 6; diorite-gabbro 4; granite 3; felsic volcanic 2; tuff 2

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
53	53	1.0	530,000

LOCATION #: 02-41 (contd.)

The deposit, which is located just east of Mud Lake, consists of pebbly sandy gravel. It contains poorly stratified silty material at depth. Utilization of this deposit could be limited because of its silt content. Most of the deposit also appears to be less than 1.0 m thick. Approximately 10,000 m^3 have already been removed.

A better local source of granular material in this area is the eskers at the west edge of this deposit. These eskers are estimated to contain between 1 and 2 million m^3 of granular material.

LOCATION #: 02-42A

AP#: 82030-196

Type of Deposit: Ice-contact

County: Victoria

Exposure Type: Scraping

Parish: Lorne

Status: Undeveloped

UTM: 587 178

NTS: 21 O/2

SECTION DESCRIPTION & COMMENTS:

0.2-0.3 m Gravel:	Pebbly sandy fine gravel
0.3-1.5 m Silt and Sand:	Interstratified silt, fine sand and medium sand. Fine layers are 0.4-1.0 m thick, coarse layers are 1-10 cm thick. Stratification is subhorizontal and even.
1.0 m+ Till:	Till

This deposit, which is located north of Clark Mountain, consists of a very small area of interstratified silt and sand. This deposit has limited potential for aggregate because of its small size, and large silt content.

MECHANICAL ANALYSIS: N.A.

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing											

LITHOLOGIC ANALYSIS: N.A.

Unsound Lithotypes: %	Sound Lithotypes: %

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
4.0	4.0	1.0	40,000

LOCATION #: 02-42B

AP#: 82030-196

Type of Deposit: Ice-contact (Esker)

County: Victoria

Exposure Type: Road cut

Parish: Lorne

Status: Undeveloped

UTM: 578 182

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

0.03 m Overburden:	Humus and Ae, Grey
0.40 m Gravel:	Orangy brown oxidized pebbly gravel
0.30 m Gravel:	Grey, pebbly gravel; 90% pebbles, 10% sand, all rounded
0.20 m Gravel:	Pebbly sandy gravel; 65% pebbles, 35% sand, all rounded (sample)
2.0 m Slump Covered:	Assumed to be gravel

This deposit, which is located north of Clark Mountain, consists primarily of pebbly gravel. The average thickness of 2.0 m is based on not only measurements at the sample site, but observations at sites 259, 260 and 263. General relief of near 5.0 m suggests that reserves calculated based on a thickness of 2.0 m are minimal. The material in this deposit has potential for borrow, crushing and screening.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	91.5	72.3	58.2	43.0	27.4	13.2	7.4	4.9	2.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 3%	Sound Lithotypes: 97%
metasediments 3	metaquartzite 72; metasediments 10; granite 5; diorite-gabbro 4; gneiss 3; felsic volcanic 2; vein quartz 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
114	69	2.0	1.38 million

LOCATION #: 02-43

AP#: 76-514-122

Type of Deposit: Ice-contact (Esker)

County: Victoria

Exposure Type: Road cut

Parish: Lorne

Status: Undeveloped

UTM: 601 174

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

0.08 m Overburden:	Humus and Ae, grey fine silty sand
0.13 m Sand:	Brown oxidized fine silty sand
0.10 m Sand:	Light brown silty fine sand
1.50 m Gravel:	Pebbly fine gravel, 50% pebbles, 50% granules and coarse sand, all rounded (sample)
2.0 m Slump Covered:	Assumed to be gravel, probably coarser, due to presence of boulders
0.5 m Gravel:	Pebbly fine gravel as above
3.0 m Slump Covered:	Assumed to be gravel, coarser

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	95.2	95.2	92.2	81.1	74.0	64.5	47.3	14.0	3.4	1.2	0.5

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0 %	Sound Lithotypes: 100 %
	metaquartzite 65; metasediments 16; vein quartz 6; greywacke 5; diorite-gabbro 4; quartz-muscovite schist 2; granite 1; tuff 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			See 02-44

LOCATION #: 02-44

AP#: 81014-100

Type of Deposit: Ice-contact (Esker)

County: Victoria

Exposure Type: Gravel Pit

Parish: Lorne

Status: Abandoned

UTM: 579 199

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

Top scraped

5.0-10.0 m Gravel: Cobbly pebbly gravel; crudely stratified; 5% cobbles and boulders, 75% pebbles, 20% coarse sand and silt. Few large boulders to 2.0 m diameter on floor of pit. All rounded, many fragments especially in the fine fraction are plates. (Sample taken at 7.0 m depth).

This deposit, which is formed by a series of esker segments, extends in a northwest-southeast direction from north of Clark Mountain to southwest of Mount McInnes. Samples taken at 02-43 and 02-44 indicate a wide variability in grain-size distribution and sorting within this deposit. Material at 02-43 contains fewer boulders and cobbles and less silt than that at 02-44. The presence of coarse material, mainly cobbles and large pebbles and silt could be a limiting factor to future exploitation. At 02-44, small stone piles are

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	91.9	66.9	44.5	23.8	12.0	5.1	3.1	2.1	1.1

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0 %	Sound Lithotypes: 100 %
	metaquartzite 66; metasediments 16; purple quartzite 8; quartz-muscovite schist 4; granite 2; vein quartz 2; felsic volcanic 1; tuff 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
182	182	5.0	9.1 million

LOCATION #: 02-44

visible in parts of the old pit, which suggest the material was screened prior to use. No unsound lithotypes were found in the pebble counts from this deposit. Material in this deposit could be used for borrow, crushing and screening, but further sampling and testing would be required to locate the best material for specific purposes.

LOCATION #: 02-45 AP#: 81014-143

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Gravel Pit Parish: Southesk

Status: Abandoned UTM: 627 275

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

0.13 m Overburden:	Humus, Ae, grey, oxidized
4.0 m Gravel:	Interbedded fine gravel and sand. Sand beds are 1-5 cm thick, medium to coarse sand with some fine sand and a little silt. Fine gravel beds are 3 to 30 cm thick, (pebbly fine gravel), with subrounded pebbles to 5 cm diameter (rare) mainly 0.5 cm diameter, with medium to coarse sand matrix. Grain size distribution is variable from bed to bed. Stratification dips gently eastward.
2.0 m Gravel:	Pebbly sandy fine gravel, interbedded with pebble layers of 5-8 cm thick (sample)
1.0 m Slump Covered:	Assumed to be gravel

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	98.4	84.0	70.8	56.3	41.4	23.4	9.0	3.3	1.2

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0%	Sound Lithotypes: 100%
	granite 54; metaquartzite 23; quartz-muscovite schist 9; metasediments 8; felsic volcanic 2; gneiss 2; vein quartz 1; tuff 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
20	20	4.0	800,000

LOCATION #: 02-45 (contd.)

This deposit, which is located just west of Greer Lake, consists of interbedded fine gravel and sand. Approximately 8,000 m^3 of material has already been removed. This deposit appears free of cobbles and boulders. The material in this deposit could be used for borrow and other local requirements.

Further exploration might locate similar granular materials in the area between Greer Lake and Loon Lake.

LOCATION #: 02-46 AP#: 81-016-39

Type of Deposit: Glaciofluvial outwash (Fan) County: Northumberland

Exposure Type: Road cut Parish: Southesk

Status: Undeveloped UTM: 666 314

NTS: 21 0/2

SECTION DESCRIPTION & COMMENTS:

Top scraped

0.70 m Gravel: Poorly stratified, 50% pebbles, 50% medium to coarse sand. All clasts are subangular. Material is loose, becoming more compact with depth. (Sample taken at 0.50 m depth.)

This deposit is located just north of Salmon Brook, and consists of poorly stratified gravel. Observations at sites 270A and 270B east of 02-46 indicate coarser material is present to the east of 02-46. This suggests the deposit was formed as a glaciofluvial fan on Salmon Brook.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing			100.0	85.7	70.6	52.1	35.1	17.1	5.3	1.8	0.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 3 %	Sound Lithotypes: 97 %
metasediments 2; schist 1	gneiss 27; metaquartzite 22; metasediments 21; quartz-muscovite schist 9; vein quartz 6; porphyry 5; felsic volcanic 5; greywacke 2

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
30	30	0.5	150,000

APPENDIX D

SUPPLEMENTARY FIELD OBSERVATIONS
SERPENTINE LAKE
(NTS 21 0/2)

SERPENTINE LAKE

236 UTM 822 338

Road cut: 0.5 - 0.8 m silty sandy till, 20% pebbles, compact with depth, rock (chlorite schist) probably close.

237 UTM 811 333

Abandoned borrow pit: 0.5 - 2.0 m stony sandy drift, 50% pebbles, subangular. Various lithologies present in pebble fraction. Rock (andesite). 4000 $m^3$of rock and drift have been removed. More is available.

238 UTM 802 330

Small pit dug with hand shovel shows: 0.2 m+: rotten granite (No sign of till on surface): Colluvium, white granite boulders are numerous through this area up to 3.0 m diameter pit along other roadside shows: 0.1 - 0.2 m very loose pebbly sandy drift.

239 UTM 802 325

Road cut: 0.5 m brown, oxidized loose, drift over 1.0 - 2.0 m brown, sandy till with silt, few pebbles over granite.

240 UTM 759 295

Road-cut: 0.3 m dark brown oxidized sand with pebbles over 0.2 m olive brown pebbly sandy till, loose.

244 UTM 868 082

Backhoe pit, top disturbed: 0.08 m Ae, grey well developed over 0.36 m oxidized, brown, stony sandy till over 2.0 m stony sandy till, grey, compact; 5% subrounded boulders to 0.8 m diameter, 25% pebbles, 5% cobbles, 65% sand and silt.

245 UTM 811 129

Abandoned borrow pit: 1250 m^3removed, more material is available; 0.8 m oxidized orangy brown stony sandy till, loose over 0.5 - 0.6 m loose, stony sandy till, light grey over 0.3 m compact stony sandy till, dark grey, medium to coarse sand, granular over 1.5 m covered. Boulders all around pit area to 1.5 m diameter, white granites.

246 UTM 792 158

Road cut and scraping: 0.05 m humus over 0.1 m grey Ae over 0.7 m oxidized orangy brown sandy drift, 5-8% cobbles to 15 cm diameter over 0.6 m semi-compact, very sandy drift possibly till, no structure, 10% pebbles, very angular, sand compact looks like derived from rotten granite over 2.0 m covered. Boulders up to 1 m diameter, common. Some roll to the topography, no sign of bedrock.

247 UTM 782 173

Road cut: 0.7 m oxidized loose very sandy till over 1.0 - 1.5 m fairly compact, (compactness increases with depth) grey, stony very sandy till; 15% pebbles all angular to subangular, 80% medium sand to granules. Boulders on surface to 1.0 m diameter.

248 UTM 764 158

Road cut: 0.5 - 1.0 m bouldery sandy drift; very loose, partly oxidized, possibly till over 2.0 - 4.0 m broken, rotten bedrock, white granite over competent bedrock, granite.

249 UTM 757 160

Road cut: 1.0 m loose, oxidized, orangy brown drift over 2.0 - 3.0 m grey more compact very sandy drift, few different lithologies; looks like till derived from rotten granite, very few pebbles, mainly sand and granules.

250 UTM 894 095

Bulldozer pit: 0.3 m pebbly sandy gravel, oxidized, loose over 0.5 - 0.7 m pebbly sandy gravel, 10-15% pebbles over 0.3 m pebbly coarse sand, 35% pebbles over 0.5 m pebbly sandy gravel over 0.5 - 0.7 m covered. Other side of road is in pebbly medium to coarse sand, getting more pebbly with depth.

251 UTM 555 104

Road cut: 0.15 m moss over 0.2 m woody humus over 0.2 m oxidized brown loose pebbly sand over 0.5 m brown stony sandy till over 3.0 m covered - rock may be close to bottom of section.

252 UTM 564 117

Road cut: 0.5 m dirty gravel, poorly sorted; 5% boulders subangular to 35 cm diameter, 50% pebbles, 45% sand and silt.

253 UTM 553 154

Drumlinoid ridge, road cut: scraping shows up to 6.0 m of compact stony till (30% boulders to 80 cm diameter, 5% boulders to 40 cm diameter; 65% pebbles, sand and silt). Rock occurs in eastward end of ridge opposite side of road.

254 UTM 548 162

Area outlined between 253 and bouldery deposit to the north could be used for possible borrow source.

255 UTM 579 111

Road cut: 1.0 m stony sandy till with silt, cobbles to 20 cm diameter with boulders to 0.5 - 0.8 m diameter.

256 UTM 573 094

Road cut in esker-like feature: 2.0 m medium to coarse sand, with granules, few pebbles to 2 cm diameter. Deposit is too small to be of interest.

257 UTM 586 083

Road cut: new road shows; 0.5 m oxidized cemented stony sandy till. Numerous boulders up to 0.8 - 1.0 m diameter on the surface; implies that this area is bouldery morainal material.

258 UTM 615 115

Road cut: 0.3 m fine pebbly sand over 0.2 m+ sandy till.

259 UTM 586 180

Road cut: 0.03 m humus over 0.02 m Ae grey over 0.3 m pebbly gravel over 1.5 m interbedded medium sand, fine-sand and silt. Beds are 3 to 10 cm thick (top bed is cross-stratified indicating eastward flow) over 0.50+ m pebbly sandy gravel (30% pebbles to 8 cm diameter). No sample taken; a deposit too fine grained and thin for exploitation.

260 UTM 566 181

Road cut in ridge: 2.5 m pebbly sandy gravel.

261 UTM 600 171

Borrow pit abandoned: completely disturbed - no good sections - scrapings and diggings show 2.0 -3.0 m gritty fine sand, few boulders up to 2.0 m diameter. Cobbles up to 10 - 15 cm can be seen through most of the pit probably derived from overlying gravel. Pit should be considered depleted with respect to gravel, but could be reactivated for sand borrow. About 11,000 m^3 removed.

262 UTM 591 181

Road cut, poor exposure: 1.0 m - 1.5 m very fine sand and silt over 4.0 - 5.0 m very dirty, pebbly gravel - ablation till. Most of the pebbles are rounded to subangular. Because of the poor exposures it is hard to make a complete assessment of this part of the deposit - should be considered only for borrow until further investigated. General stratigraphy is probably silt over gravel over ablation till.

263 UTM 581 186

Road cut in a small kame: 5.0 m pebbly fine gravel, (few cobbles and rare boulders up to 3.0 m diameter; 95% pebbles and coarse sand). All rounded.

264 UTM 577 208

Scraping - poor exposure: 0.2 - 0.5 m gravel in half of scraping other half shows 0.2 m silty fine sand over fine gravel. Probably capping of sand and gravel over the till visible along the creek. Exploitation very limited by thickness and extent.

265 UTM 589 272

Scraping: 0.5 - 1.0 m stony sandy till, olive brown over - rock - silicifed crenulated schist.

266 UTM 606 341

Gravel pit, abandoned: (located in kame on side of hill) approximately 5000 m removed. Section shows 8.0 m sandy gravel (boulders to 40 cm diameter, 20% pebbles, 35% coarse sand).

267 UTM 616 272

Old scraping: 2.0 m sandy stony till with some silt, moderately compact at top becoming more compact with depth.

268 UTM 627 275

Hand dug pit: shows 8 cm humus over 5 - 10 cm Ae grey, well developed, fine sand with silt, few grits over 5 cm very dark brown oxidized fine sand with silt over 5 - 8 cm orangy brown, oxidized, fine sand some silt over 20 cm stony compact silty till some sand (pebbles to 8 cm diameter, all plastered with silt). No sand and gravel.

269 UTM 648 295

Abandoned gravel pit: 0.02 m humus over 0.03 m Ae grey over 0.9 m pebbly fine gravel (40% coarse sand to granules) over till. This deposit is too thin to constitute a major source.

270A UTM 670 315

Road cut: up to 8.0 m pebbly sandy gravel (50% coarse pebbles, 50% fine pebbles to coarse sand, all subangular, few boulders to 30 cm diameter). This deposit was not exploited for road construction, possibly because of pebble and boulder content; and variability of material.

270B UTM 673 315

Section on east side of creek indicates extension of fan, comprised of 6.0 - 8.0 m bouldery, pebbly sandy gravel. Further east, sand underlies the gravel.

271 UTM 678 333

Road cut: 0.8 - 1.0 m very sandy till, brown (10% pebbles, no boulders except on surface, 90% sand, rest of scraping shows few boulders, 50% pebbles).

272 UTM 688 336

Small pit, abandoned: 1.5 m very sandy till, brown, 30% sand and pebbles, trace silt; compact. Few pebbles to 8 cm diameter on surface.

273 UTM 519 185

Road cut and scraping in esker: 2.0 - 3.0 m pebbly gravel (few cobbles, very little coarse sand). Deposit usable for borrow.

277 UTM 718 338

Road cut: 0.1 m humus, leached rotten granite over 0.3 m rotten granite weathered to sand sized over 0.7 m rotten granite.

APPENDIX E

SAMPLE DESCRIPTIONS OF CALIFORNIA LAKE (NTS 21 0/8)

LOCATION #: 08-14

AP#: 74-510-221

Type of Deposit: Alluvium

County: Northumberland

Exposure Type: Borrow Pit

Parish: Northesk

Status: Abandoned

UTM: 103 369

NTS: 21 0/8 E

SECTION DESCRIPTION & COMMENTS:

1.5 m Gravel:	Pebbly gravel; brown, subangular to subrounded; cobbles to 30 cm diameter, 70% pebbles, 30% coarse sand
0.4± m Sand:	Interbedded medium sand and silt

This alluvial deposit is adjacent to the Northwest Miramichi and South Branch Northwest Miramichi Rivers. It covers part of the extreme southeast corner of map 21 0/8 West, part of the extreme southwest corner of map 21 0/8 East and part of the northwest corner of map 21 0/1 East. Samples taken at 08-14 and sites 164 and 165 indicate some variability in the silt and cobble content of the gravel component of this deposit. Generally, the gravelly component has good potential for borrow, possibly crushing

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	96.4	80.7	63.7	51.8	41.9	27.1	10.9	5.7	3.3	1.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0%

Sound Lithotypes: 100%

greywacke 25; felsic volcanic 15; tuff 14; gneiss 13; granite 12; vein quartz 9; porphyry 7; quartz-muscovite schist 3; intermediate volcanic 2

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
460	400	1.0	4 million

LOCATION #: 08-14 (contd.

and screening. Sandy material from this deposit could be used locally for road building or other purposes. The sandy component has limited potential because of its silt content and the fact that extraction depths may be limited by high water tables adjacent to the Miramichi River. Also siltation and erosion could be altered along different segments of the river if exploitation adjacent to the river were to occur.

This deposit is not easily accessible due to the absence of a good road leading to it.

LOCATION #: 08-15 AP#: 74-503-37

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Borrow Pit Parish: Northesk

Status: Abandoned UTM: 006 408

NTS: 21 O/8 W

SECTION DESCRIPTION & COMMENTS:

Top of section disturbed

0.4 m Sand:	Brown, silty pebbly sand; 25% pebbles, 70% medium sand, 5% silt; all subrounded to subangular
0.4 m Gravel:	Brown, silty sandy gravel; 5% cobbles to 20 cm diameter, 65% pebbles, 30% medium sand and silt; subangular to angular clasts (sample)
0.8 m Slump Covered:	Assumed to be gravel
0.2 m+ Till:	Olive brown, silty sandy till

This deposit consists of four segments of glaciofluvial outwash located along the Northwest Miramichi River. They form a series of low level terraces adjacent to the river. They are composed of pebbly sand and sandy gravel. The

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	89.1	62.5	41.7	28.4	18.9	10.8	6.0	3.3	1.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 4 %	Sound Lithotypes: 96 %
vein quartz 2; greywacke 1; tuff 1	quartz-muscovite schist 47; greywacke 16; vein quartz 13; felsic volcanic 8; diorite-gabbro 6; tuff 3; metaquartzite 2; porphyry 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
50	35	1.0	350,000

LOCATION #: 08-15 (contd.)

analyzed sample is representative of the gravelly units within most of the deposit. This material has good potential for road building purposes. A few unsound lithotypes were noted in the pebble count. Utilization of the deposit may be restricted because of its proximity to the river (see 08-14). Exploitation would best be limited to local use.

LOCATION #: 08-16

AP#: 74-503-34

Type of Deposit: Glaciofluvial outwash

County: Northumberland

Exposure Type: River section and hand dug hole

Parish: Northesk

Status: Undeveloped

UTM: 967 427

NTS: 21 0/8 W

SECTION DESCRIPTION & COMMENTS:

0.02 m Overburden: Humus

6.0 m Gravel: Brown sandy fine gravel; 60% pebbles, 40% coarse sand to granules. Sand is subangular; pebbles subrounded to subangular

Sample: 3.0 m depth

This deposit, which is adjacent to the Northwest Miramichi River, is located southwest of Little Big Bald Mountain. It consists of sand and gravel forming small outwash terraces. This material has local potential for borrow, crushing and screening. Extensive use of the deposit is restricted by its location, both its isolated geographic locations and its position adjacent to the river.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing			100.0	89.5	78.6	68.1	54.0	31.2	16.3	8.0	3.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0 %

Sound Lithotypes: 100 %

diorite-gabbro 28; quartz-muscovite schist 21; granite 19; metaquartzite 11; greywacke 8; felsic volcanic 7; vein quartz 6

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
22	22	0.5	110,000

LOCATION #: 08-17 AP#: 74-503-34

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Road cut Parish: Northesk

Status: Undeveloped UTM: 962 399

NTS: 21 0/8 W

SECTION DESCRIPTION & COMMENTS:

0.10 m Overburden: Humus and Ae

0.50+ m Gravel: Brown sandy, pebbly gravel; 10% cobbles to 30 cm diameter (flat), 50% pebbles, 40% angular, fine to coarse sand. Top 30 cm oxidized

0.40 m Slump Covered: Assumed to be gravel

This deposit consists of cobbly gravel. This deposit has little potential for other than local use because of its isolated location, poor access, and limited size. The analyzed sample is considered representative of the material found in the deposit.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	86.9	86.9	82.5	75.2	67.9	60.2	43.3	18.1	8.5	5.0	2.2

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 3 %	Sound Lithotypes: 97 %
gabbro 2; schist 1	diorite-gabbro 45; granite 24; schist 7; metaquartzite 7; greywacke 5; tuff 4; vein quartz 3; porphyry 1; intermediate volcanic 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
14	14	1.0	140,000

LOCATION #: 08-18

AP#: 74-501-69

Type of Deposit: Ice-contact

County: Northumberland

Exposure Type: Borrow Pit

Parish: Northesk

Status: Abandoned

UTM: 213 507

NTS: 21 0/8 E

SECTION DESCRIPTION & COMMENTS:

Note that the lower part of the pit is in an alluvial terrace. Top 1.0 m removed by scraping

0.75 m Till:	Orangy brown, oxidized till or colluviated till; silty stony diamicton; 20% cobbles to 30 cm diameter (mainly schist), 50% pebbles, 30% sand and silt
7.0 m Till:	Dark reddish brown, silty stony diamicton, moderately hard and compact; 30% cobbles to 20 cm diameter, 40% pebbles, 30% sand and silt. Boulders to 1.0 m diameter in the lower part.
0.5 m Sand:	Pebbly sand, angular, medium to coarse sand with 10% pebbles
4.0 m Gravel:	Cobbly gravel as above

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	92.3	78.6	58.9	40.4	22.7	9.4	5.1	3.4	1.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 4 %	Sound Lithotypes: 96%
schist 2; shale 1; felsic volcanic 1	felsic volcanic 39; intermediate volcanic 20; metaquartzite 10; diorite-gabbro 9; vein quartz 9; granite 4; greywacke 3; quartz-muscovite schist 2

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			10,000

LOCATION #: 08-18 (contd.)

SECTION DESCRIPTION & COMMENTS:

6.0 m Gravel:	Cobbly, gravel as above with interbed of pebbly sand up to 0.5 m thick comprising 30% of section. Pebbly sand layers contain 50% pebbles and 50% medium to coarse sand. Sample taken at 3.0 m.
4.0 m Slump Covered:	Assumed to be gravel

This ice-contact deposit, which is located just south of the Nepisiguit River, consists of cobbly gravel with a till capping. The deposit forms a small bench at the base of a bedrock-cored slope. The sample is considered representative of the coarse pebbly gravel within the deposit. Approximately 140,000 m^3 of gravel and till have been removed. An estimate of reserves by the Department of Transportation was completed in 1981.

This ice-contact deposit is adjacent to an alluvial terrace that has an estimated total workable area of 10 hectares and could possibly generate 200,000 m^3 of granular material.

LOCATION #: 08-19 AP#: 74-501-69

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Pit Parish: Northesk

Status: Abandoned UTM: 209 510

NTS: 21 0/8 E

SECTION DESCRIPTION & COMMENTS:

LOCATION #: 08-19A

0.02 m Overburden:	Humus
0.3 m Sand:	Oxidized sand (B zone)
0.0-0.3 m Sand:	Fine sand
1.4 m Gravel:	Cobbly pebbly gravel (Manganese rich layer 1.10-1.27 m depth); grain size increases with depth; 10% cobbles to 20 cm diameter, 70% pebbles, 20% fine sand and silt. All coarse clasts well rounded. (In some sections 0.5 m black, pebbly gravel, pebbles all rounded).
0.5 m Gravel:	Sandy pebbly gravel; 80% pebbles, 20% angular, coarse sand

(CONTINUED)

MECHANICAL ANALYSIS: 08-19C

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	95.3	84.5	64.3	45.8	30.6	16.7	9.3	5.8	4.1	3.1

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 9%	Sound Lithotypes: 91%
sandstone 6; schist 2; breccia 1	greywacke 18; metaquartzite 18; granite 13; quartz-muscovite schist 11; vein quartz 10; gneiss 9; intermediate volcanic 8; porphyry 3; felsic volcanic 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
20	5.0	8.0	400,000

LOCATION #: 08-19A (contd.)

2.5 m Sand & Gravel:	Interbedded subangular medium to coarse sand and pebbly fine gravel
5.0 m Slump Covered:	Assumed to be interbedded sand and gravel
	Toward the creek the total section is 3.0-4.0 m thick, but the additional section is covered

LOCATION #: 08-19B UTM 206 511

1.0 m Gravel:	Cobbly gravel with rounded boulders to 40 cm diameter; 10% cobbles, 70% rounded pebbles, 20% medium to coarse subangular sand
1.8 m Gravel & Sand:	Fine pebbly gravel and coarse to very coarse sand with 10% pebbles, cobbles and boulders to 40 cm diameter
4.0 m Slump Covered:	Assumed to be gravel and sand
	In places 2.0 m x 50 cm thick lenses of interbedded, medium and fine sand, and silt occur within the lower unit

LOCATION #: 08-19C UTM 207 511

1.5-2.0 m Gravel:	Bouldery gravel; 30% boulders up to 1.0 m diameter, commonly 50 cm diameter and less; sand and pebbles
3.0-3.5 m Gravel:	Pebbly gravel (sample taken at 2.5 m from top of unit)
6.0 m Slump Covered:	Assumed to be gravel

LOCATION #: 08-19D UTM 208 510

0.4 m Sand:	Fine to medium sand, rounded, brown
0.3 m Gravel & Sand:	Pebbly gravel; 80% pebbles, 20% coarse sand
0.3 m Gravel & Sand:	Fine gravel; 60% pebbles, 40% coarse to very coarse sand
3.0 m Gravel & Sand:	Pebbly fine gravel
2.0 m Gravel:	Pebbly sandy gravel; 15% boulders to 5.0 m diameter, 10% pebbles
3.0 m Slump Covered:	Assumed to be gravel

LOCATION #: 08-19E UTM 299 510

Top removed

6.0 m Gravel & Sand: Pebbly sandy gravel; subrounded boulders to 2.0 m x 4.0 m occurs near the top of the section

LOCATION #: 08-19F UTM 212 510

In campground

3.0 m Gravel & Sand: Pebbly sandy gravel; 5% cobbles to 20 cm diameter, 60% pebbles, 35% coarse sand. All rounded.

5.0 m Slump Covered: Assumed to be gravel and sand

Some boulders to 50 cm diameter occur at the base of the slump. One 6.0 m x 2.0 m boulder or piece of bedrock occurs at the centre of the section

This deposit is located just north of the Nepisiguit River. Only 5.0 hectares are considered as workable area for future exploitation as much of the deposit has been removed and the east end of the deposit is now used as a campground. The remaining material has good potential for borrow, crushing and screening.

LOCATION #: 08-20A AP#: 74-506-114

Type of Deposit: Ablation Till County: Gloucester

Exposure Type: Borrow Pit Parish: Bathurst

Status: Abandoned UTM: 253 569

NTS: 21 0/8 E

SECTION DESCRIPTION & COMMENTS:

0.01-0.03 m Overburden: Humus and Ae

0.2 m Sand: Sand; fine silty sand, oxidized; few cobbles at base

2.0-3.0 m Till: Silty sandy pebbly ablation till; 40% pebbles, cobbles to 40 cm diameter, 40% sand, 20% silt; crudely stratified as shown by alignment of pebbles and a few 1 cm thick beds of medium to coarse sand. In places 2.0 m x 40 cm lenses of stratified medium to coarse sand with some silty fine sand beds. All particles subangular. Sample taken at 2.0 m depth.

LOCATION #: 08-20B UTM 254 568

0.5-0.6 m Silt: Fine sandy silt with few boulders to 20 cm diameter

1.0-2.0 m Till: Ablation till similar to 08-20A

Rock, highly schistose shale, possibly some tuff beds

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	94.9	79.7	66.3	57.0	42.5	29.0	27.8	8.8	1.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 4 %	Sound Lithotypes: 96 %
sandstone 2; gabbro 1; pyritiferous quartz vein 1	metasandstone 40; felsic volcanic 23; gabbro 9; vein quartz 9; tuff 7; intermediate volcanic 5; schist 2; metaquartzite 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
75	50	2.0	1.0 million

LOCATION #: 08-20 (contd.)

This deposit, which is adjacent to Boucher Brook, consists of ablation till. It is crudely stratified with a few sandy lenses. In part of the pit, the rock underlying the till has been excavated, although over most of the pit the rock has been avoided. The material is variable in texture and the analyzed sample may not be representative of the entire deposit. Some unsound lithotypes were encountered in the pebble counts. The material is adequate for local requirements.

LOCATION #: 08-21

AP#: 74-504-90

Type of Deposit: Ablation Till

County: Northumberland

Exposure Type: Road cut

Parish: Northesk

Status:

UTM: 201 523

NTS: 21 0/8 E

SECTION DESCRIPTION & COMMENTS:

Top of section removed

4.0 m Gravel: Dirty gravel; poorly sorted; subangular clasts, cobbles and boulders to 30 cm diameter; 90% pebbles, fine to coarse sand

This deposit is located just north of the Nepisiguit River. It consists of poorly washed glaciofluvial gravel or ablation till. The material could be used for borrow, crushing or screening. Attention should be given to the presence of unsound lithotypes. The deposit is limited in extent and as such should only be exploited for local use.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	100.0	96.3	91.6	79.4	65.4	54.4	41.5	28.8	18.0	3.9	0.7

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 2%	Sound Lithotypes: 98%
rotten sulphide-rich rock 1; schist 1	metasandstone 53; felsic volcanic 22; gabbro 11; tuff 5; intermediate volcanic 3; vein quartz 2; granite 1; schist 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
21	21	3.0	630,000

LOCATION #: 08-22

AP#: 74-504-90

Type of Deposit: Glaciofluvial outwash

County: Northumberland

Exposure Type: Pit

Parish: Northesk

Status: Abandoned

UTM: 175 527

NTS: 21 0/8 E

SECTION DESCRIPTION & COMMENTS:

Top scraped

6.0 m Gravel: Cobbly pebbly gravel; 20% subrounded cobbles to 30 cm diameter, 60% pebbles, 20% medium to coarse sand, subangular

This small deposit located along the Nepisiguit River east of Devil's Elbow forms a small terrace of cobbly gravel. Approximately 12,600 m³ of material has been removed. The workability of the deposit could be limited by the watertable. The material could be used for borrow, cursching and screening. The deposit is small in size and should be used only to serve local requirements.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	93.2	88.6	82.1	64.4	48.4	35.8	23.3	9.6	3.5	0.9	0.5

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 3%	Sound Lithotypes: 97 %
schist 2; red shale 1	metaquartzite 18; felsic volcanic 17; metasediments 15; greywacke 10; tuff 9; diorite-gabbro 9; granite 7; gneiss 6; intermediate volcanic 3; quartz-muscovite schist 2; vein quartz 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m³) probable
5	5	3.0	150,000

LOCATION #: 08-23

AP#: 74-504-87

Type of Deposit: Glaciofluvial outwash

County: Northumberland

Exposure Type: Road cut

Parish: Northesk

Status: Undeveloped

UTM: 139 531

NTS: 21 0/8 E

SECTION DESCRIPTION & COMMENTS: - SECTION A:

0.02 m Overburden:	Humus
0.80 m Sand:	Oxidized, pebbly medium sand, clean; 30% pebbles to 1 cm diameter
0.40 m Sand:	Medium-fine sand, clean, subrounded
0.30 m Sand:	Fine silty sand
0.20 m Sand:	Loose coarse sand and fine pebbles, very clean, subangular

SECTION B:

1.0 m Sand:	Crudely stratified, cemented fine gravelly sand; 10% pebbles up to 2 cm diameter
0.50 m Gravel:	Fine pebbly gravel; 33% pebbles; 67% fine gravel and sand, clean, all rounded, loose. (Sample)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	86.1	86.1	82.3	74.3	62.4	50.8	24.0	5.7	5.7	1.5	0.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 1%	Sound Lithotypes: 99%
schist 1	felsic volcanic 15; tuff 14; diorite-gabbro 13; metasediments 13; greywacke 9; granite 8; metaquartzite 7; vein quartz 7; gneiss 5; quartz-muscovite schist 5; porphyry 3

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			See 08-24

LOCATION #: 08-24 AP#: 74-504-87

Type of Deposit: Glaciofluvial outwash County: Northumberland

Exposure Type: Pit Parish: Northesk

Status: Abandoned UTM: 131 529

NTS: 21 0/8 E

SECTION DESCRIPTION & COMMENTS:

Top removed

1.6 m Gravel: Cobbly sandy gravel; 20% cobbles to 20 cm diameter, 80% medium-coarse sand and pebbles, all rounded. Some 3 cm thick beds of coarse sand; lenses 15 cm thick by 3.0 m of stratified medium to coarse sand

1.7 m Gravel: Pebbly fine gravel; pebbles and coarse-very coarse sand, all rounded, loose. (Sample taken at 1.0 m from top of unit)

4.7 m Slump Covered: Assumed to be gravel

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing			100.0	95.9	77.7	49.8	26.2	14.3	12.4	4.0	2.1

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 6%

quartz-muscovite schist 2; highly altered rock 2; metasediments 1; gneiss 1

Sound Lithotypes: 94 %

felsic volcanic 26; gneiss 15; vein quartz 12; tuff 10; greywacke 9; metasediments 9; muscovite schist 8; diorite 2; intermediate volcanic 2; granite 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
229	190	5.0	9.5 million

LOCATION #: 08-24 (contd.)

This major deposit consists of a number of glaciofluvial outwash terraces located along the Nepisiguit River. Some textural variability exists within this deposit. For example, crudely stratified sand and pebbly gravel were noted at 08-23, cobbly pebbly gravel at 08-24, and pebbly sandy gravel at 08-25 and 08-26. Observations at sites 205 and 208 indicate that the boulder content increased within some of this deposit. Unsound lithotypes were present in parts of the deposit, mainly at 08-24 where 6% of the pebbles were found to be unsound. Approximately 12,600 m^3 of material has been removed from 08-24, 7,200 m^3 from 08-25 and 1,500 m^3 from 08-26. Most of this outwash complex has potential for use as borrow. However, as shown by observations at sites 205 and 208 some parts of the deposit have potential for crushing and screening.

This deposit is for the most part easily accessible by a gravel road between Bathurst and Pople Depot. Low inaccessible terraces on the south side of the Nepisiguit River were not included in probable recoverable reserves. A pine plantation may limit immediate use of the west part of the deposit.

LOCATION #: 08-25

AP#: 74-501-62

Type of Deposit: Glaciofluvial outwash

County: Northumberland

Exposure Type: Pit

Parish: Northesk

Status: Abandoned

UTM: 089 501

NTS: 21 0/8 E

SECTION DESCRIPTION & COMMENTS:

Top stripped

0.15 m Gravel:	Oxidized pebbly gravel
0.60 m Gravel:	Pebbly gravel; 65% pebbles, 35% sand, all rounded
0.30 m Gravel:	Cobble layer. Cobbles to 20 cm diameter, all rounded
1.0 m Gravel:	Pebbly sandy gravel; 5% cobbles to 20 cm diameter, 65% pebbles, 40% sand, all rounded
2.0 m Slump Covered:	Assumed to be gravel
	Sample taken between 1.0 m and 2.0 m from surface

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	94.6	87.6	83.3	65.2	47.1	34.4	22.6	10.3	4.1	1.8	0.9

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0%

Sound Lithotypes: 100%

metasediments 17; granite 14; felsic volcanic 14; vein quartz 12; greywacke 10; meta-quartzite 10; diorite-gabbro 7; gneiss 6; intermediate volcanic 4; tuff 4; porphyry 2

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			See 08-24

LOCATION #: 08-26

AP#: 74-501-60

Type of Deposit: Glaciofluvial outwash

County: Northumberland

Exposure Type: Pit

Parish: Northesk

Status: Abandoned

UTM: 069 495

NTS: 21 O/8 W

SECTION DESCRIPTION & COMMENTS:

Top removed

7.0 m Gravel: Pebbly sandy gravel; 5% cobbles to 25 cm diameter, 50% pebbles, 45% sand. Coarse fraction is rounded. Sand is subangular to subrounded, loose

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	83.9	67.7	50.0	40.2	24.5	11.6	8.4	2.8	1.6

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 2 %	Sound Lithotypes: 98 %
metasediments 2	gneiss 18; diorite-gabbro 15; metasediments 15; granite 14; greywacke 9; metaquartzite 8; felsic volcanic 7; tuff 4; porphyry 3; quartz-muscovite schist 2; vein quartz 2; intermediate volcanic 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			See 08-24

LOCATION #: 08-27

AP#: 74-501-58

Type of Deposit: Ice-contact

County: Northumberland

Exposure Type: Gravel Pit

Parish: Northesk

Status: Abandoned

UTM: 012 513

NTS: 21 0/8 W

SECTION DESCRIPTION & COMMENTS:

0.02 m Overburden: Humus

4.0 m Gravel: Pebbly sandy gravel, brown; 50% pebbles and cobbles to 20 cm diameter, 50% medium to coarse sand; all rounded. Few boulders on floor of pit to 40 cm diameter.

This major ice-contact deposit, which contains a number of esker segments, is located along the Nepisiguit River. It consists of sandy and pebbly gravel. It also contains varying amounts of cobbles and boulders as might be expected in an ice-contact deposit. Samples taken at 08-27, 08-28 and 08-29 are considered representative of the accessible part of the deposit on the north side of the Nepisiguit River, although sandy facies have been noted at some observation sites, e.g. 213 and 232. Lithologic analysis shows that 3% and 6% of the clasts examined at 08-28 and 08-29 are unsound. This deposit contains material suitable for borrow, crushing and screening.

(CONTINUED)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing		100.0	91.1	68.5	54.0	44.6	33.7	19.1	18.5	2.6	1.3

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 0%

Sound Lithotypes: 100 %

felsic volcanic 18; granite 17; metasediments 17; diorite-gabbro 14; vein quartz 10; metaquartzite 9; gneiss 5; porphyry 3; mafic volcanic 3; greywacke 3; quartz-muscovite schist 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
1,000	700	3.0	21 million

LOCATION #: 08-27 (contd.)

The estimated recoverable reserve include material that is south of the Nepisiguit River and is presently inaccessible as no bridge crosses the river in this vicinity. Some 1,350 m^3 of material has been removed from 08-27. This deposit is accessible by a main gravel road between Bathurst and Pople Depot.

LOCATION #: 08-28

AP#: 74-504-79

Type of Deposit: Ice-contact

County: Northumberland

Exposure Type: Road cut

Parish: Northesk

Status: Undeveloped

UTM: 998 514

NTS: 21 O/8 W

SECTION DESCRIPTION & COMMENTS:

0.21 m Overburden:	Humus and Ae
0.20 m Sand:	Oxidized silty fine sand with pebbles
2.0 m Gravel:	Pebbly sandy gravel; 2% boulders to 40 cm diameter, 10% cobbles, 50% pebbles, 38% fine to coarse sand, all rounded. Sample taken at 1.5 m from top of unit
4.0 m Slump Covered:	Assumed to be gravel

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	95.1	89.3	82.9	66.7	48.6	38.8	22.5	12.1	11.9	3.8	2.3

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 3%	Sound Lithotypes: 97 %
schist 2; quartz-muscovite schist 1	granite 15; vein quartz 14; diorite-gabbro 13; gneiss 13; felsic volcanic 11; metasediments 10; greywacke 9; metaquartzite 4; quartz-muscovite schist 4; mafic volcanic 2; tuff 2

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			See 08-27

LOCATION #: 08-29

AP#: 74-504-79

Type of Deposit: Ice-contact

County: Northumberland

Exposure Type: Road cut and Scraping

Parish: Northesk

Status: Undeveloped

UTM: 990 514

NTS: 21 0/8 W

SECTION DESCRIPTION & COMMENTS:

0.08 m Overburden:	Humus and Ae
1.0 m Gravel:	Pebbly gravel with 5% cobbles and boulders to 0.5 m diameter, 65% pebbles, 30% fine to medium sand, large clasts are subangular to subrounded
2.0 m Slump Covered:	Assumed to be gravel
1.0 m Gravel:	Pebbly sandy gravel; 40% pebbles, few cobbles to 15 cm diameter, 60% sand and fine gravel. (Sample)

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing			100.0	89.1	66.8	46.2	17.3	7.9	4.7	2.3	1.4

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 6%	Sound Lithotypes: 94 %
sandstone 3; quartz-muscovite schist 2; chlorite schist 1	granite 25; metasediments 23; greywacke 14; vein quartz 10; quartz-chlorite schist 9; quartz-muscovite schist 8; intermediate volcanic 3; gneiss 1; tuff 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
			See 08-27

LOCATION #: 08-30 AP#: 81016-153

Type of Deposit: Ice-contact (Kame) County: Northumberland

Exposure Type: Road cut Parish: Northesk

Status: Undeveloped UTM: 896 367

NTS: 21 0/8 W

SECTION DESCRIPTION & COMMENTS:

Cover:	Spruce, tea, moss, sedges
0.08 m Overburden:	Humus and Ae
1.0 m Gravel and Sand:	Slope debris-mixture of gravel and sand
1.5 m Gravel:	Sandy fine gravel, few cobbles, rare boulders to 30 cm diameter; subangular to subrounded, 60% pebbles, 40% sand
4.0 m Slump Covered:	Assumed to be gravel

This deposit, which is located along the South Nepisiguit River, consists of pebbly sandy gravel. The deposit is small in size and has only potential for local use.

MECHANICAL ANALYSIS:

sieve	31.5mm	25mm	19mm	9.5mm	4.75mm	2.36mm	1.18mm	600um	300um	150um	75um
% passing	90.4	87.7	81.3	71.1	56.5	37.0	19.0	9.4	8.0	4.0	2.8

LITHOLOGIC ANALYSIS:

Unsound Lithotypes: 4 %	Sound Lithotypes: 96%
metasediments 3; diorite 1	gneiss 22; metasediments 21; granite 18; diorite-gabbro 12; greywacke 8; vein quartz 6; metaquartzite 3; quartz-muscovite schist 3; intermediate volcanic 2; felsic volcanic 1

ESTIMATION OF RESERVES:

total deposit area (hectares)	area workable (hectares)	average thickness (metres)	recoverable reserves (m^3) probable
7	7	1.5	105,000

APPENDIX F

SUPPLEMENTARY FIELD OBSERVATIONS
CALIFORNIA LAKE
(NTS 21 0/8)

CALIFORNIA LAKE

152 UTM 108 366

Depleted borrow pit: 2.0 of till, sandy with cobbles and boulders to 40 cm diameter over rock.

156 UTM 082 396

0.5-0.7 m stony sandy loose till: pebbles up to 8 cm diameter; 10% silt. Most of the pebbles are coated with silt.

157 UTM 028 413

Abandoned till pit: depleted. Sand veneer over 1.5-2.0 m till.

158 UTM 025 429

Old trench area!! New trenches have been recently dug and later filled in (90 offset from old ones). Section in trenches shows: cover, pine, tea and moss over 0.2 to 2.0 m+ stony sandy till over rock. Main lithology is a highly deformed phyllite or schist. Some silicification as quartz veins.

159 UTM 988 436

Abandoned borrow pit in alluvial terrace: reserves depleted. Originally contained 1.0 m+ dirty sandy gravel, probably overlying till. Large boulders occur in creek.

160 UTM 973 430

Road cut: 1.0 m medium to coarse sand with 10% pebbles to 3 cm diameter; rare pebble to 15 cm diameter. Sand and pebbles are subangular to subrounded.

161 UTM 967 423

Depleted borrow pit: 1.5 m pebbly coarse sand, brown; 20% subrounded to subangular pebbles to 3 cm diameter; 80% coarse to very coarse, angular sand, comprised of potassium feldspar, plagioclase and quartz. Note: this sand was probably derived from a weathered granite (colluvium) source.

162 UTM 956 405

Road cut: jack pine, spruce, tea and moss; 2 cm humus; 2 cm Ae; 40 cm+ brown sandy till (top 35 cm oxidized); 30% pebbles and cobbles to 15 cm; 70% sand, angular, trace silt.

163 UTM 955 409

Road cut: 0.03 m humus over 0.07 m Ae over 0.15 m gritty sand over 0.4 m+ loose, sandy till; 40% pebbles, cobbles and boulders to 30 cm diameter; 50% angular sand; 10% silt and clay.

164 UTM 032 381

Road cut: 0.03 m humus over 0.02 m Ae over 0.05 m sandy gravel; 30% pebbles; 70% medium - coarse sand over 1.0 m sand, medium to coarse; 10% pebbles to 3 cm diameter.

165 UTM 055 381

Abandoned borrow pit: in glaciofluvial outwash; 0.04 m humus over 0.05 m Ae over 2.0 m sandy pebbly gravel; 15% pebbles and cobbles to 15 cm diameter; 30% sand over 0.4 m fine-medium sand with 10% 1 cm diameter pebbles and some silt beds.

166 UTM 222 406

Open pit: part of mine; 2.0 m till, brown sandy stony over 8.0 m rock. Other sections in pit show rock almost to the top.

167 UTM 193 415

Borrow pit, abandoned: Bedrock visible in parts of the bottom of the pit and in some of the walls. 2.0-3.0 m brown, stony sandy till; few boulders to 70 cm diameter; 40% pebbles, 60% sand and some silt. All angular. (22,500 m^3 removed).

168 UTM 194 422

Abandoned borrow pit: 0-1.0 m stony sandy till over 8.0 m rock.

169 UTM 133 393

Borrow pit, abandoned: 0.5 m till, sandy stony over 2.0-8.0 m rock-red-weathering, greenish grey, schistose metasandstone. Material used for local borrow for logging road. Unlimited supply available, especially because till is thin over the rock. Rock outcrops in many

places at the surface. (47,500 m^3 removed).

170 UTM 117 409

Abandoned borrow pit: (minor amounts removed) 1.0-1.5 m stony sandy till over rock. Other pits on the east side of the river are in metasandstone. In all pits, excavation is less than 1.0 m deep.

171 UTM 220 439

Abandoned borrow pit: 1.0-2.5 m compact stony sandy till (10,000 m removed) overlying bedrock (intermediate metavolcanic). Minor amounts of bedrock were removed.

172 UTM 220 442

Abandoned borrow pit: 0.5 m-2.0 m compact, stony sandy till overlying bedrock. It appears that more rock was removed from this pit than at 173. Note that this pit was reopened when the main road was improved since 1974. (15,000-22,500 m^3 removed)

173 UTM 226 456

Abandoned borrow pit: 2.5 m stony sandy till over rock (basic to intermediate volcanic). Two directions of striations @ 070 trend and 090 trend, the latter being most prominent. (1,800 m^3 removed)

174 UTM 256 447

Abandoned borrow pit: in volcanics (intermediate to basic). 1,200 m removed, locally used. Very thin till cover.

175 UTM 227 463

Abandoned borrow pit: 0.5-2.0 m+ stony sandy till over rock.

176 UTM 226 481

0.6 m till, silty sandy over 6.0 m rock, volcanic. This pit has been abandoned for some time as it is completely overgrown. (360,000 m^3 removed, mostly rock)

177 UTM 259 506

Borrow pit: abandoned and completely depleted. This was probably originally a glaciofluvial terrace formed on a bench cut in till, with a thin gravel capping. The gravel was probably less than two metres

thick. The present floor of the pit is in till, silty sandy.

178 UTM 216 502

L-shaped abandoned borrow pit: (28,000 m removed) 1.0 m+ pebbly gravel, cobbles to 25 cm diameter, subangular to subrounded, 20% coarse sand. All coated with pyrolusite over 1.0 m+ till, sandy stony, brown, 20% angular boulders to 30 cm diameter, 30% pebbles, 30% sand, 20% silt, compact over 1.0 m+ rock, purplish black weathering schist, rotten. Note most of the material removed was from the gravel; the floor of the pit is mainly in till, however in places rock is exposed and has been removed.

179 UTM 213 505

Abandoned roadside pit: 0.6 m till, silty stony till as at 180 over 2.0-2.5 m rotten purplish black schist.

180 UTM 209 503

Several borrow pits in a series of small kames. At present most of the deposit has been depleted with less than 3,000 m remaining. The material is a pebbly sandy gravel, cobbles to 20 cm diameter, rare boulders to 50 cm, 60% pebbles, 40% medium to coarse sand. The glaciofluvial material overlies sitly sandy till.

181 UTM 207 506

Abandoned borrow pit: 2.0-3.0 m pebbly sandy gravel over till and or rock. Reserved depleted.

182 UTM 202 509

Abandoned till, rock pit; 1.5-2.0 m till, stony, sandy over rock. Although the pit has been abandoned, more material is available for borrow on demand.

183 UTM 195 511

Abandoned borrow pit: 0.5-1.0 m till, stony, sandy, brown over 2.0-3.0 m rock, purplish black schist. Could easily be reactivated for further borrow in rock. (5,000 m^3 removed)

184 UTM 183 480

Abandoned borrow pit, depleted: Originally 1.0-3.0 m very pebbly sandy gravel; 30% cobbles and boulders to 30 cm diameter, 40% pebbles, 30% coarse sand. Uphill is till; downhill is bedrock. Approximately 6,000

m^3 of material remain in this deposit.

185 UTM 203 511

Alluvial terrace 2.0 m above river level is underlain by subangular fine-to medium sand, some pebbles to 2 cm diameter.

186 UTM 249 572

Borrow pit, abandoned: 4.0 m till, silty sandy; brown 30% pebbles average 2 cm diameter, 10% cobbles and boulders to 2.0 m diameter (breccia), 40% sand, 20% silt. Hard compact. Material available is very limited by the location of the roads and river. Borrow pit to east of sideroad shows: 2.0 m of poorly developed ablation till (silty sandy; 20% silt, 40% sand, 40% pebbles) with pockets of poorly sorted sandy gravel overlying rock (highly schistose shale).

187 UTM 243 587

Abandoned pit, depleted: 0.5-1.0 m pebbly sandy gravel (30% cobbles to 15-20 cm diameter few boulders to 1.5 m diameter) over rock, intermediate volcanic (andesite). Mainly the gravel has been removed from the pit (40,000 m^3 removed). Some rock, 4.0 m deep or 21,000 m^3 has been removed, more is available but may be hard to excavate.

188A UTM 237 638

Rock probably right to surface.

188B UTM 237 640

0.5-1.0 m till, stony sandy brown over rock. Rock is very shistose shale (slate).

189 UTM 171 611

Abandoned pit, depleted: 0.02 m humus over 0.02 Ae over 1.0 m sandy gravel, 60% pebbles subangular; 40% sand, subangular over rock - shistose volcanic.

190 UTM 169 616

2.0 m till, stony sandy with silt; fairly compact over rock (felsic volcanic or tuff).

191 UTM 168 613

Abandoned borrow pit: 6.0 m+ ablation till; cobbles and boulders to 2.0 m diameter; 60% pebbles, 40% sand and silt. All fractions are subangular, moderately loose. (2,400 m^3 removed)

192 UTM 200 567

Abandoned borrow pit, depleted: 0.5-1.0 m sandy stony till over rock. (Volcanic)

193 UTM 206 519

60 cm hand dug pit in road cut shows: sandy stony material (probably ablation till) with 10% silt, becomes more compact with depth. The surface is disturbed by road construction, but it is believed that there is 4.0 m till over rock (volcanic with pyrite, pyrrhotite). The pit was stopped on boulders.

194 UTM 193 526

50 m long road section: 3.0-4.0 m olive brown stony sandy till with silt, numerous boulders to 0.8 m diameter, 40% pebbles, 60% sand and silt. Hard and compact.

195 UTM 178 527

Poor road cut: 2.0 m pebbly sandy gravel; 10% cobbles, 35% pebbles, subrounded, 55% fine to coarse sand, overlies rock.

196 UTM 167 530

Gravel pit, depleted: 3.0-4.0 m pebbly stony gravel with sand lenses; 20% cobbles to 25 cm diameter, 70% pebbles, 10% sand, all rounded. Sand lenses are up to 1.0 m thick by 2.0-3.0 m long (mainly stratified, cross bedded medium sand). Note: The upper part of the pit looks more like a mining operation than a rock quarry. It looks like the surface till has been removed to expose a sulphide rich (pyritiferous) rock.

197 UTM 147 594

Abandoned borrow pit: till veneer over rock, depleted except for rock. Part of pit has been used for sawmill stock piling.

198 UTM 140 604

Road cut: 1.5 m stony sandy till with silt; cobbles and boulders to 30 cm.

199 UTM 091 632

Road cut, borrow pit: 3.0-4.0 m cobbly sandy ablation till, loose, brown, silt plastered on most pebbles; 10% cobbles to 20 cm diameter; 95% fine pebbles, sand and silt. Possible rock at foot of slope.

200 UTM 111 574

Abandoned borrow pit: 0.05 m humus over 0.3-0.5 m stony sandy till over 2.0-5.0 m rock, black shale, rotten, some quartz veins. More material available for borrow.

201 UTM 169 596

0.5 cover over bedrock; only the cover has been removed (1,800 m^3). Bedrock source unlimited-for future borrow site 3,600 m has been cleared and stripped.

202 UTM 011 613

Road cut: 0.01 m humus over 0.03 m oxidized over 0.05 m stony silty till with sand.

203 UTM 941 629

Roadside borrow pit: 0.04 m humus over 0.01 m Ae over 0.4 m oxidized over 3.0 m compact sandy till (boulders to 30 cm, 60% sand and silt).

204 UTM 950 576

Roadside borrow pit, abandoned: 0.01 m humus over 0.02 m Ae over 0.4 m oxidized over 1.0-1.5 m sandy stony till, most pebbles are angular and of the same (gneissic) lithology over 2.0 m broken bedrock.

205 UTM 124 525

100 m long road cut shows: 2.0-3.0 m of bouldery sandy gravel; 10% boulders up to 0.5-0.7 m diameter; 30-40% pebbles, rounded.

206 UTM 111 517

100 m long road cut shows: 4.0 m pebbly sandy gravel; 5% cobbles to 20 cm diameter; 65% pebbles; 30% medium to coarse sand; all subrounded.

207 UTM 083 499

2 m sandy ablation till; 15% pebbles and cobbles to 0.8 m diameter, 85% sand. Some 20 cm thick lenses of poorly stratified sand. Probably overlies more compact (basal) till. Note that this deposit occurs as a ridge or knoll and could be a kame.

208 UTM 076 494

0.5-0.7 m bouldery cobbly gravel over 2.0 m cobbly sandy gravel with boulders.

209 UTM 072 495

Abandoned gravel pit - scraping: no good exposures (less than 5,000 m^3 removed) 2.0 m of pebbly sandy gravel at top of 6.0 m high hill.

210 UTM 048 497

200 m road cut shows: 2.0-3.0 m very bouldery sandy gravel, boulders to 0.8 m diameter, numerous cobbles to 0.3 m diameter, all rounded except for largest boulders. Abundance of boulders and cobbles would limit future exploitation of this part of the deposit. Material is probably ice-contact gravel.

211 UTM 025 506

Abandoned gravel pit: 1.0 m pebbly sandy gravel (6,000 m^3 removed) future development will require going deeper.

212 UTM 014 512

Road cut: 2.0 m pebbly sandy gravel, 50% medium sand; subrounded.

213A UTM 988 513

1.0 m medium sand over 0.4 m medium to fine sand; surface bare, possibly disturbed.

213B

0.7 m disturbed gravelly sand over 0.1 m Ae, grey sandy (medium to fine) over 0.5 m gravelly sand, oxidized, orangy brown over 0.3 m clean loose pebbly fine gravel, sandy.

213C

0.3 m fine pebbly gravel.

213D

0.1 m fine-medium sand over 0.3 m fine pebbly gravel.

213E

0.4 fine sand, overlying pebbly fine sand. It appears that the fine sand is eolean and is draped over the side of the hill.

214 UTM 980 515

2.0 m stony sandy, fairly compact ablation till. Very few boulders to 1 m diameter.

215 UTM 976 516

1.0 m ablation till, sandy stony over 1.0 m compact, stony sandy basal till; 20% pebbles, cobbles and boulders to 30 cm diameter, 40% sand and silt.

216 UTM 963 519

Abandoned gravel pit: 2.0 m pebbly sandy gravel with cobbles, few boulders over 0.7 m medium-coarse sand, very clean (1,200 m^3 removed)

217 UTM 964 531

Small road cut + scraping shows: 0.5-1.0 m+: stony sandy till with silt (fairly compact).

218 UTM 964 540

Road cut: spruce, few pine, birch, tea and moss: 5 cm humus, black over 3 cm Ae, grey, well developed over 30 cm oxidized, orangy-brown, loose, pebbly sand, silty over 30 cm olive brown, loose, sandy till over 30 cm dark brown, compact stony sandy till; 45% pebbles, 55% sand and silt over 50 cm covered over 50 cm rotten shale over 1.0 m covered.

219 UTM 964 547

Other end of continuous road cut from 218: 1.0 m loose sandy till over 2.0 m compact stony sandy till. Note the depth to rock varies along

this section, but at this end the till is at its thickest.

220 UTM 958 557

Spruce, birch, tea and moss: 10 cm humus over 3 cm Ae, grey over 40 cm orangy brown, oxidized loose sandy pebbly gravel, some crude stratification, probably colluvium over 1.5 m olive brown, compact, stony, sandy till with silt; 45% pebbles and cobbles to 15 cm diameter, 55% sand and silt over 1.5 m covered.

221 UTM 958 560

Abandoned borrow pit: 1.0-2.0 m till, sandy stony, over rock (sericite schist, silicified). (less than 3,000 m^3 removed)

222 UTM 913 613

Road cut, large scraping: 2.0-4.0 m lodgement till, compact blocky structure, stony sandy till with silt.

223 UTM 887 626

Road cut in gravel ridge - undeveloped: 0.01 m humus over 0.02 m Ae, grey silty sand over 0.3 m fine sandy, pebbly silt over 0.8 m pebbly gravel; 70% pebbles, 30% sand; all rounded over 0.4 m pebbly sandy gravel; 30% pebbles, 70% sand over 0.3 m pebbly gravel; 70% pebbles, 30% sand over 4.0 m covered - base of slope is covered by pebbles, cobbles and boulders to 30 cm diameter.

224 UTM 886 640

Small hand dug pit shows: 0.15 m olive-brown, pebbly silty till, very compact. No sand or gravel overlying the till. Pit dug just below old terrace level.

225 UTM 907 634

0.5-1.5 m loose sandy till, brown over 2.0 m very compact, greyish brown silty till, with abundant shale (slippery) fragments.

226 UTM 910 582

Hand dug pit in scraping: 0.3 m brown, very sandy till, fairly compact with depth; 40% pebbles, few cobbles to 20 cm diameter, 60% sand and silt. Note that the pebbles are derived from at least 6 different lithologies including granite (white and pink), shcists (two types), metaquartzite and quartz veins.

227 UTM 909 578

Veneer of sandy till over broken schist (chloritic). Two erratic lithologies were noted, one andesite and a sandstone.

228 UTM 901 575

0.5-0.7 m stony sandy till over broken schist (several different lithologies present in till).

229 UTM 901 555

Hand dug pit showed: 0.30 sandy till; with 30% pebbles, few cobbles to 15 cm diameter, 70% sand and silt. Various lithologies are present but are most apparent in the fine-medium pebble fraction.

230 UTM 960 520

Road cut: 0.5-1.5 m cobbly, bouldery ablation till over 1.0 m sandy stony ablation till; 70% pebbles, 30% sand; some layers of pebbles (0.5 - 1.0 cm diameter); few boulders and cobbles; fairly loose over 2.0 m covered over 1.0 m cobbly, sandy ablation till, fairly loose; 5% cobbles, 35% pebbles, 60% sand over 4.0 m covered.

231 UTM 951 521

Abandoned gravel pit in an esker: 1.5 m pebbly sandy gravel; 35% pebbles, 45% medium to coarse sand, all subangular to subrounded. Less than 2,000 m of material has been removed from this pit; 12,000 m^3 are readily available with another possible 4,000 m^3 if the esker is completely exploited.

232 UTM 946 519

Abandoned gravel pit: 0.3 m sandy pebbly gravel over 0.5-0.8 m pebbly sandy gravel over 0.2 m medium sand with ripple marks over 0.2 m interstratified pebbly sand and medium sand over 3.0 m fine to medium sand. The gravel has been depleted from this source; abundant sand is still available.

233 UTM 936 516

Abandoned borrow pit: 1.0 m till, stony sandy with boulders over 3.0 m rock, broken - quartzose gneiss.

234 UTM 898 519

Abandoned borrow pit: 0.3 m sand over 2.0 m sandy stony till with some silt.

235 UTM 886 521

Road cut: 1.0 m pebbly sandy gravel, loose over 1.0 m cover over till.

241 UTM 889 392

Road cut: surface has abundant white and pink granite boulders to 2.0 m diameter; 0.03 m humus over 0.05 m Ae grey over 0.3 m oxidized, brown sand over 0.2 m oxidized loose stony sandy till over 0.5 m loose stony sandy till, very pebbles stones over 0.5 m compact, brown sandy till with pebbles.